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INDIANAPOLIS: THE CONVENTION CITY

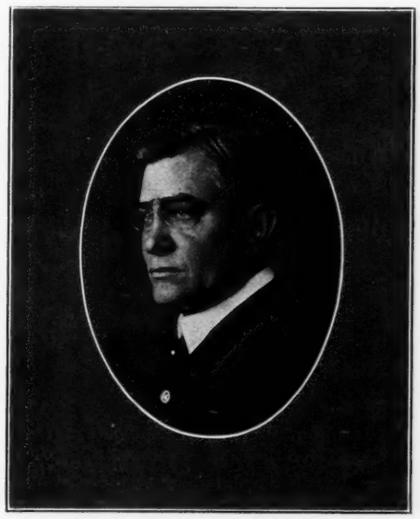
Some of the Many Attractions of Indianapolis, Where the Annual Convention of the American Society of Municipal Improvements Will Be Held October 20-22, 1903

By Theodore A. Randall *

"THE Convention City" is a title to which many cities lay claim with more or less justification. While every important commonwealth has attractions peculiar to itself, no American city possesses, in a greater degree, the prime essentials for successful conventions than does Indianapolis.

The most important features to be considered in arranging for commercial gatherings is accessibility and facilities for accommodating and entertaining visitors. The former is the most important consideration with business men with whom time is money, and it is in this respect that the Hoosier capital appeals most forcefully, for its central location and unequaled railroad facilities enable visitors for distant points to gather there more readily than at any other point in the country.

Indianapolis is what its name implies it should be, the "State City," being a compound of the word Indiana for the State, and the Greek word polis, meaning city. Naturally, being the metropolis, as well as the capital of the State, Indianapolis has always been the center of the social, political, educational and industrial life of the State. Its courts, legislatures, libraries, commerce and social life draw to it the brightest and most active and forceful men and women from every section of the State. Every Indianian is proud of his Capital city, and as opportunity offers contributions to its glory. While none are so enthusiastic as to acclaim, "See Indianapolis, and die," many do live better for having seen the city and come in touch with the spirit of progress and liberality which pervades its institutions, and of which the outer world has had an occasional glimpse through the statesmanship of Harrison, the lovable rhymes of Riley, the eloquence of Beveridge, and the world wide influence of May Wright Sewall, and numerous other educators, authors and moulders of public opinion.



CHARLES A. BOOKWALTER
Mayor

The actual center of population of the United States, at the present time, as determined by the last census, is a point some thirty miles southeast of Indianapolis. Postal officials, who are informed in such matters, claim that a larger number of important points throughout the country can be reached more quickly from Indianapolis than from any other postoffice. This is due, in part, to the fact that Indianapolis is but a little east of the geographical center of the United States, and also to its unrivalled facilities for transporting mail, afforded by the sixteen railroads entering the city. Passenger traffic is afforded equal facilities, and delegates find that after they have finished their convention work, they can get sleeping car service to almost any distant point, and so journey homeward while they sleep. All trains, and there are nearly two hundred daily, enter and depart from the Union Station.

THE CITY'S ATTRACTIONS

The city's attractions are many. The chief object of interest to all strangers is the great Soldiers' and Sailors' Monument. This stands in the center of the city, and, as the reader may judge from the accompanying engraving, is one of the finest and most interesting works of monumental art in the world. The imposing shaft, the beautiful cascades, and the magnificent allegorical groups of statuary, tell of the glory of Indiana's soldiers in a manner so impressive that it can never be forgotten. The movement which resulted in the building of this great monument originated with the Department of Indiana, Grand Army of the Republic. After that organization had raised a considerable fund by voluntary subscriptions, the State Legislature was appealed to and appropriated half a million dollars for its completion. The shaft including the crowning figure of "Miss Indiana" is nearly three hundred feet in height. The monument is open to visitors the year around. Every visitor ought to view the city and surounding country from the top of this monument, which is reached by electric elevator, for a prettier panorama of industrial and pastoral life cannot well be imagined.

The spot on which the monument stands was originally intended for the residence of the Governor of the State. The plat is circular in form, being four hundred feet in diameter and is at the intersection of Market and Meridian streets, which were originally intended to divide the city north and south, east and west, respectively. At the outer extremes of the four squares forming this intersection, broad avenues extend notheast, northwest, southeast and southwest, afford-

*Editor of *The Clay Worker*, Indianapolis.

ing a means of making a short cut to the extremes of the original plat which covered a mile square. The other north, south, east and west streets run at right angles, dividing the city into squares of four hundred and twenty feet on each side. These in turn are divided by alleys running in each direction through the center of each square. Strangers are usually impressed by the unusually wide streets. Washington street, the main business thoroughfare, is one hundred and twenty feet wide from curb to curb. This is a historical roadway, having been a part of the old National road over which, in the early days, nearly all the wagon traffic passed en route from Washington to St. Louis.

The city is built on a level plane, and while there are no hills worthy of the name within its boundaries, there is enough elevation and depression, or unevenness of surface, to break the monotony of flat streets and afford fair grades for drainage purposes. It is one of the best sewered cities in the country, there being over one hundred and thirty miles of completed sewers, the largest of these being twelve feet in diameter. Through this is carried all the sewage of the city which flows into White River, a shallow stream which winds through the western outskirts of the city. The engineering problems involved in this system have been difficult, but they have been solved wisely. The general plan is so satisfactory that there is little likelihood of any change or alteration ever being required.

Some of THE MUNICIPAL JOURNAL'S readers may be interested in the statistics of the city. It now comprises an area of more than thirty square miles, has over ninety miles of improved streets and alleys. There are forty-five miles of asphalt, twenty-seven miles of brick, fifteen miles of wooden block pavement, all laid on concrete foundation, the balance being macadam. These pavements have cost, in round numbers, $5,000,000. There are more than fifty miles of underground conduits, no overhead wires being allowed in the heart of the city. There are two telephone companies in operation, the Bell, or Central Union Telephone Company, and the New Telephone Company. The latter was established in 1898 and has outstripped the old company in the number of 'phones in use.

A MODERN METHOD OF HEATING

The most recent addition to the city's public service institutions is the Merchants' Heat and Light Company, which has a franchise for furnishing electric light and steam heat in a certain defined territory in the business center of the city, covering a half mile square. Their rate for light is 7½ cents per thousand watts, and for steam heat 30 cents per square foot of radiating surface. This Company began service to a limited number of patrons January 1, 1903, and is now putting down mains and expects to cover the entire territory effectively the coming winter. The Home Heating and Lighting Company is another and similar enterprise. This Company has been in operation for two years. Its franchise covers a part of the north side, the best residence portion of the city, which is pretty thoroughly piped. It furnishes heat by the hot water system. The fact that it has more applications for service than it can supply is an indication that the system is a success. Other similar heating plants are projected, and in time, no doubt, the whole city will be heated and lighted from central plants.

Indianapolis is noted for its cleanliness. For ten years her residents enjoyed the blessing of natural gas. It was used almost exclusively for heating purposes and the result was a clean atmosphere which naturally led to clean streets, clean houses, clean surroundings. Like naturally begets like, and tidy surroundings lead to tidy habits, so that while through the failure of natural gas, Hoosiers may have to go back to soft coal, they do so reluctantly, and there is a constant and painstaking effort to prevent the city from drifting back into the slovenly condition which is apt to result from a smoky, sooty atmosphere. Smoke consumers are required in all large structures, and while they have not worked to the entire satisfaction of users, they certainly lessen the smoke nuisance.

The comfort of visitors depends in no small degree upon the hotel accommodations, and in this respect Indianapolis has always acquitted herself with credit, and now that she has a new million-dollar hotel, the Claypool, the most fastidious visitor can be accommodated in a manner that bars criticism. The Denison House, Hotel English and the Grand Hotel, are all first-class hostelries, and there are innumerable small hotels where the stranger can get such entertainment as his propensity and purse demand.

CONVENTION HALLS

For deliberate bodies, where the attendance is three hundred or less, the Claypool will afford ample accommodations for all sessions. It has two convention halls—a sun parlor and an assembly hall—that are admirably adapted to such meetings. Where the attendance reaches the five hundred mark, or over,

INDIANA STATE SOLDIERS' AND SAILORS' MONUMENT

the Deutsch Haus, a German Club and amusement place, afford splendid facilities, and for larger assemblies, where a seating capacity

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of one thousand or more is desired, Tomlinson Hall, which is owned by the city, is all that could be desired.

Municipal Affairs

Indianapolis is a well governed city. In 1893, a new charter was secured, under which the mayor is the controlling power. All the boards of control and heads of departments are appointed by His Honor, and subject to his direction. It is a one-man government, so that when anything goes wrong, there is no doubt as to who is responsible. The present mayor, Charles A. Bookwalter, is a rare combination of energy and executive force. He is essentially a man of action. He has ideas and the courage to put them into effect. As a result, his is a strenuous administration, and as might be expected, he has aroused those who differ with him as to policy, but he has accomplished results. The city is progressive and up-to-date. Improvements are made where needed and modern methods prevail in every department. When the officers of other cities composing the American Society of Municipal Improvements gather here and examine into the workings of our city, they may learn some things to their profit.

The most important unsettled public problem at present is the elevation of the railroad tracks. This has been under consideration for a long time. A general scheme had been mapped out, which it was thought would be acceptable to all interested parties. The Legislature was appealed to for an enactment that would enable the city to compel the railroads to accept the proposition, but the Citizens' League, having the matter in charge, was unable to secure its passage. Unless the city and the railroads come to a mutual understanding, the matter will have to remain in abeyance for another year or two, at least.

The City's Revenues

Indianapolis is now a million dollar institution; that is, her annual revenues now reach that sum. They are secured by direct taxation, and license fees. The former is limited to 90 cents on one hundred dollars of actual valuation. The city is also permitted to incur bonded indebtedness not exceeding 2 per cent. of appraised value. At the present time, the administration has not reached either limit, the present tax rate being 88 cents, of which 2 cents must be reserved as a sinking fund, and 1 cent each for the Fire Department and Police Department Pension Funds.

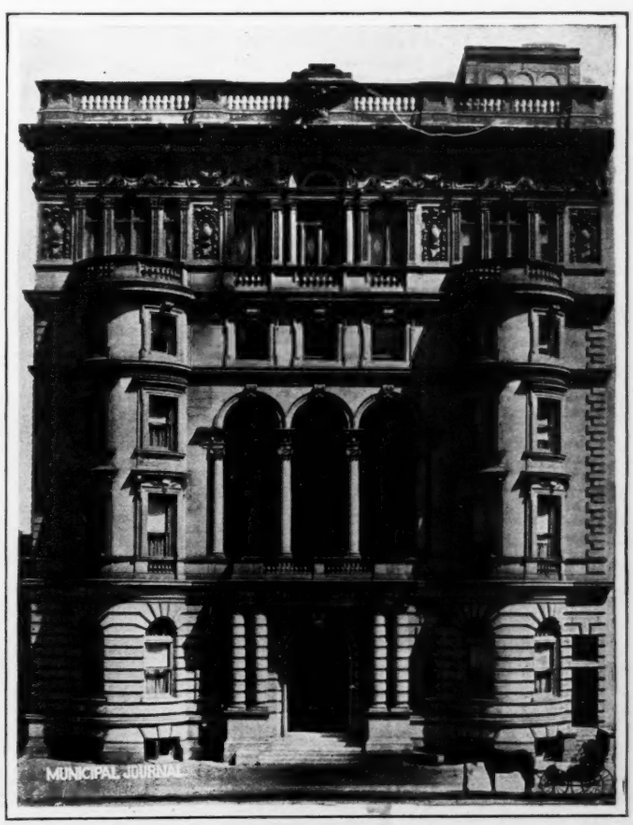
The valuation of city property is made by the Township Assessors, and the taxes are collected by the County Treasurer who, under the law, must act as City Treasurer. The merging of these city and the county offices has proven very satisfactory. It is both a great saving and a convenience to the taxpayers. The license fees collected amount all told to something over $300,000. Saloons are charged $250 a year; the total revenue from this source amounts to $133,500. All vehicles are taxed from $1 up, according to character, the revenue from this source amounting to $46,000, while the minor fees, such as dog tax, peddlers' and hucksters' licenses, etc., net about $10,000. The city also gets 5 per cent. of the gross receipts of the Merchants' Light and Power Company, in return for the franchise granted.

Another source of income, which, in time, may amount to a snug sum, is a tax of five cents per car on all interurban traffic. There are now seven interurban lines entering the city, and a number of others being constructed, which make Indianapolis the greatest interurban center in the Nation. These interurban lines are now building a million-dollar union terminal station. It will be a ten-story structure, and will occupy one-half block near the center of the city.

The Indianapolis Street Railway Company, which owns and controls all of the city lines, is generally regarded as one of the best managed street car systems. It now has over one hundred and twenty-five miles of track, employs 1,500 men, pays taxes on a valuation of $4,000,000, and, in addition, pays the city annually $30,000. It also gives universal transfer privileges, and sells six tickets for a quarter, or twenty-five tickets for a dollar. As the service is the best that modern equipment can afford, there is little fault to be found with the present street car situation.

The City's Water Supply

The Indianapolis Water Company is one of the most important local institutions. It now has in use two hundred and thirty-five miles of mains. It has five pumping stations with a total daily capacity of 57,000,000 gallons, and has improvements under way now that will increase this to 87,000,000. The Company operates thirty-one driven wells to a depth of three hundred and ninety feet. The water from these wells is pumped by pneumatic power. There is also under construction a series of immense filter beds. These are being built by the United States Sand Filtration Company. They have three of these filter beds each being three hundred and fifty feet long and two hundred feet wide. The bottom of these beds is constructed of concrete, on which hollow tile with perforated tops are placed. Five inches of gravel is then spread over the top. After



COLUMBIA CLUB

CITY BUILDING—HOME AND POLICE HEALTH DEPARTMENTS

passing through these filter beds the water is run into two clear water storage basins each seventy feet wide by three hundred and fifty feet in length. They are fifteen feet six inches in depth, which gives them a capacity of 5,000,000 gallons.

These filter beds and storage basins are built at the confluence of Fall Creek and White River, from which, on emergency, they can draw an unlimited supply of water. Under normal conditions, however, the supply is supposed to be taken from the deep driven wells, which affords a supply of pure water needing no filtration. The Company supplies the city with nearly 2,000 hydrants at an annual cost of $45.00 each.

There was a time when the Indianapolis Gas Company was an indispensable necessity, and at the same time rather an expensive luxury, but since electricity has come into general use, the Gas Company has grown less important and more reasonable in its services and charges. For some time past, it has been furnishing gas for illuminating purposes for $1 per thousand cubic feet, and, in July, it voluntarily reduced the price to 95 cents, with a promise that if the consumption reaches certain figures, the price will be reduced to 90 cents. This rather proves the assertion that for the consumer, at least, competition is a good thing.

THE POLICE DEPARTMENT

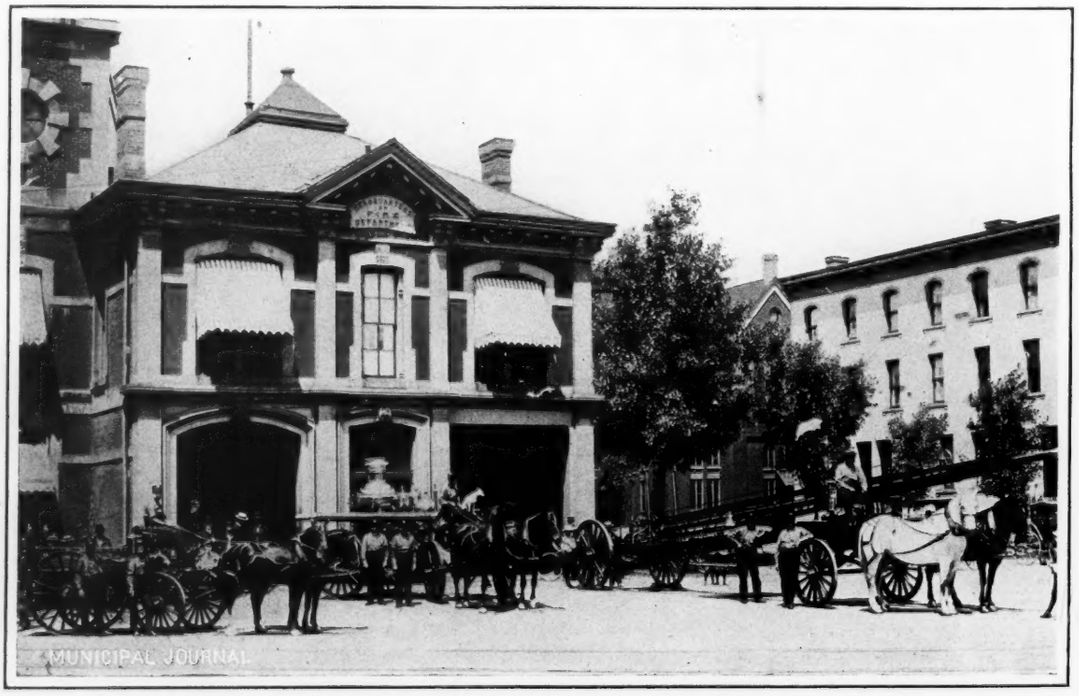
Law and order prevails in Indianapolis, and her Police Department will compare favorably with the best. It is under the control of the Board of Safety. The latter consists of three commissioners appointed by the Mayor, each receiving the nominal salary of $600 per annum. The chief executive officer is the Superintendent of Police. He, too, is appointed by the Mayor, and draws a salary of $2,000 a year. The present encumbent, George A. Taffe, has been connected with the Department for more than a quarter of a century and was appointed Superintendent, or Chief of Police with the advent of the present administration.

Police headquarters are located in the City Building on South Alabama street, which is a handsome stone structure erected in 1897. The building is modern throughout and affords office accommodation for the police officers and detective department, spacious court rooms for the Criminal Judge, and burglar proof lock-ups for from seventy-five to one hundred prisoners. The force now includes one hundred and sixty patrolmen, ten officers, and eight bicycle policemen. The latter, Chief Taffe considers one of the best features of the service. The force is divided into day and night "gangs" of four each. In 1902, these eight men made 1,987 arrests. The promptness with which they can reach zones of trouble is disastrous to petty criminals. At present, the city has but one patrol wagon, and as it must cover thirty square miles of territory, it sees but few idle hours in the entire twelve months.

The detective department uses the Bertillon system of identification, and since its installation, that department has accumulated about 3,000 photographs in its rogues' gallery. The city has also the Gamewell System of Fire Alarm and Patrol boxes. There are 400 of these in use, and every officer on duty must call headquarters every half hour.

A very commendable feature of the department is the pension fund which is maintained under a special law enacted by the Legislature in 1899. A special tax of one cent on $100 is collected by the city, and 1 per cent. of the gross salaries of the officers and all witnesses, fines collected from members of the force and sums realized by the sale of unclaimed plunder goes to this fund, which is controlled by a Board of Trustees composed of the Mayor, City Treasurer, Superintendent of Police, and six members of the Police force, who are elected by vote of the force.

Any member of the force who is disabled or is incapaciated by sickness is entitled to a pension the equivalent of one-half of the salary he was receiving at the time of diablement. If a member of the force who has been in service fifteen years or more reaches the age of fifty, he can retire on a similar pension. Upon the death of a



HEADQUARTERS OF INDIANAPOLIS FIRE DEPARTMENT

member of the force, $150 is paid the widow and she is allowed a pension of $20 per month during her widowhood, and each child until the age of sixteen, is allowed $6 per month. If a deceased leaves a dependent father or mother, he or she is allowed a pension of $12 per month. The plan is admirable in every way.

A Juvenile Court was established two years ago, before which all youthful prisoners and offenders are tried. This keeps the wayward youth from coming in contact with hardened criminals, and oftimes, instead of sending the culprit to jail or the House of Correction, they are subjected to corporal punishment administered by the parent under the eye of the Court, or the supervision of the police, as the Judge may elect. This method of handling juvenile toughs is proving very efficacious. The city building will well repay a visit from all who are interested in such affairs, as will also the county jail, which is directly across the street. This, too, is a thoroughly modern building, equipped with every known device for the imprisonment of criminals.

MERIDIAN STREET, LOOKING NORTH—PAVED WITH VEEDERSBURG BLOCK IN 1894, AND IN GOOD CONDITION TO DAY—SUBJECTED TO HEAVY TRAFFIC

The Fire Department

The Indianapolis Fire Department has a reputation among the fire department officials of America of being one of the best fire fighting organizations. This ought to be the case, for Hoosiers have always been great fighters. Indeed, that is what the name stands for. The term "Hoosier" originated during pioneer days when primitive methods prevailed and every man had to fight for his rights. It is related that a little band of settlers on the southern border of the State was attacked by a lot of freebooters from across the river. Though outnumbered three to one, the Indianians repulsed and vanquished the attacking party, killing a number of them. The few who escaped returned to Louisville, declaring that they had been "licked" by a lot of "Huzzars"—meaning desperate fighters. From that time on, the term was applied to all the settlers on the north shore of the Ohio River. The "u" was given the soft sound, and so ultimately all Indianians became known as "Hoosiers," and it is further related that the pioneers took great pride in this appellation, for it stood for bravery and daring, which in those days were crowning virtues.

The Fire Department is also governed by the Board of Public Safety, which appoints the fire chief, who receives $2,000 a year, and two assistant chiefs at $1,200 a year. There are now employed two hundred and fifteen men, who are divided among thirty-four companies. There are eleven engines, three chemicals, ten trucks, and one water tower. The latter is one of the most recent additions to the department and is much valued by Chief Charles E. Coots, who has been connected with the Department almost all his life. The same is true of Assistant Chief John P. Glazier, who comes of a family of firemen. The latter is the inventor of the turret nozzle, which is illustrated on the back cover of The Municipal Journal. Other members of this Department have contributed valuable inventions, which are now in use in all up-to-date Departments, such as the device for automatically opening the doors of stalls by electricity. This was first devised by Cicero Siebert. The snap collar and the device for releasing the harness also originated in the Indianapolis Department, being the invention of one of the Glazier Brothers, who, with twelve other firemen, perished in The Bowen-Merrill Fire in 1890. This Department also has a pension fund similar to that of the Police Department, which is maintained and disbursed to disabled members and their families in much the same fashion. Any member of the Fire Department can, after twenty-five years of service, retire voluntarily on half pay. After twenty years of service, if dismissed for any cause, other than felony, the members are allowed $30 a month. The Gamewell System is in use, and the arrangement of automatic recording charts at the headquarters will prove very interesting to visitors. In addition to the hundreds of alarm boxes located all through the city, a constant fire watch is maintained in the tower of the Courthouse, from which a good view is had of the entire city. Trained men are on duty here constantly, and it is surprising how quickly they detect indications of fires. A bit of smoke in a new spot is cause for immediate investigation, and if occasion requires an alarm is immediately sent to the nearest company, and as a result, many a conflagration is nipped in the bud, so to speak.

TOMLINSON HALL—OWNED BY CITY—USED FOR LARGE CONVENTIONS—REVENUE OF $15,000 YEARLY FROM FIRST FLOOR, WHICH IS USED AS PUBLIC MARKET

EDUCATIONAL AND SOCIAL INSTITUTIONS

As a seat of learning, Indianapolis is second to few cities in America. Her public schools are conceded by educators to rank with the best. Recently all the leading local colleges were united in one organization to be known as the University of Indianapolis, and there is now contemplated a series of new buildings, which will afford a suitable home for this great institution. There is also a movement on foot, with every prospect of success, for the establishment of a great technical school, which will be in advance of any similar institution heretofore established.

Almost every known character of charitable institution, religious organization and benevolent society has been established in the city. During the summer considerable attention is paid to the care of the children of the poor. A cottage was built and furnished especially for the accommodation of these little unfortunates, where they are taken and cared for by professional nurses through the heated term. This refuge is known as The McCullough Cottage, and is located in Fairview Park, one of a number of very beautiful suburban parks.

A series of parks and boulevards is now in course of construction. When completed, it will rival in beauty and extent those of cities many times the size of Indianapolis.

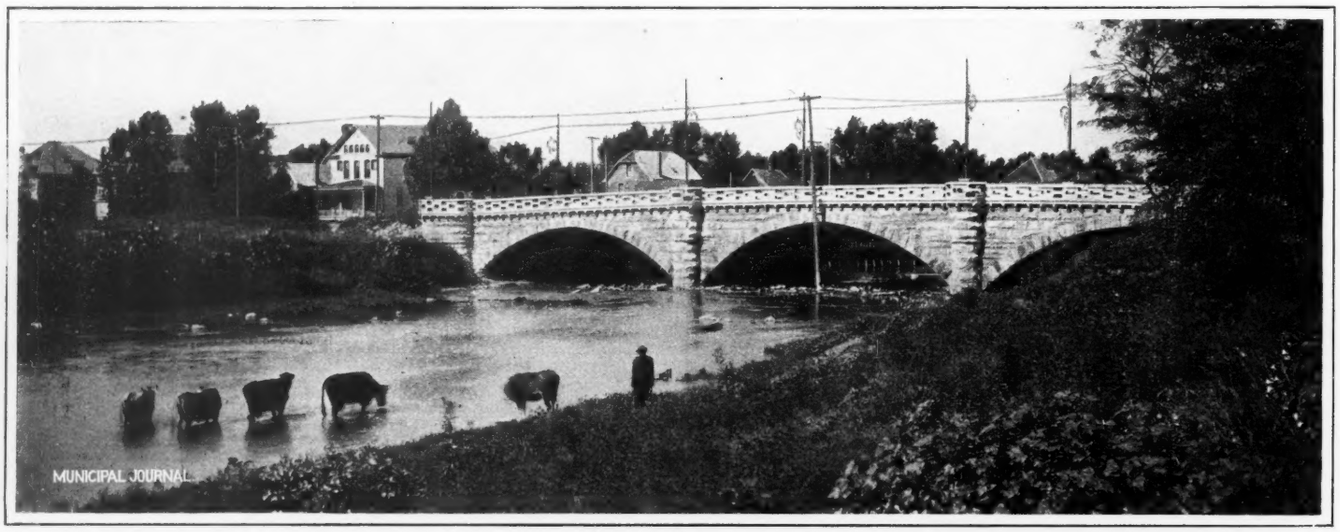
Indianapolis is noted as a city of homes, and it is claimed, with apparent justification, that a larger number of her residents own their own homes, in proportion to population (225,000), than any other American city.

There are the usual commercial bodies, such as the Board of Trade, Chamber of Commerce, and Commercial Club, all of which own their own homes, and do their full share in entertaining visitors.

Much more might be said if space would allow. The members of the A. S. M. I. are urged to come to the Convention, sample Hoosier hospitality, and see for themselves that Indianapolis is "no mean city."

WOOD PAVEMENTS

Indianapolis has, at the present time, over fifteen miles of wooden block pavements. Of these, about two-thirds are constructed of creosoted pine blocks, which are now considered par excellence in street paving by many property holders. It is an ideal pavement, especially for fine residence streets, being comparatively noiseless, clean and durable. Judging from present experience, these creosoted pavements will prove more durable than any heretofore used. On a number of streets, subject to heavy traffic, creosoted blocks have been down from three to five years, and yet show no perceptible wear. A case in point is a stretch of pavement at the head of College Avenue. It is subject to exceptionally heavy traffic, of the worst sort; heavy laden wagons from the outlying rural districts pass over it and carry with them dirt which is ground into the pavement. Notwithstanding this, the pavement is apparently as good as when first laid.



A PASTORAL SCENE IN THE SUBURBS OF INDIANAPOLIS

TO IMPROVE THE BELGIAN HIGHWAYS

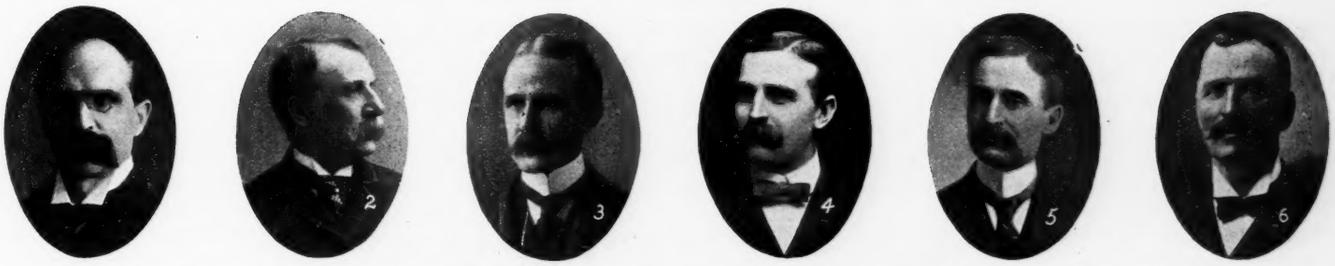
THERE has been a good deal of discussion in Belgium concerning the formation of an organization to construct and maintain the highways. The great activity of the railway traffic has greatly influenced the highway traffic. In 1830 there were but 2,027 miles of highways and 928 miles of communal roads. At present there are 4,106 miles of state highways, 8,642 miles of communal roads paved or macadamized and about 683 miles of streets.

The highways are separated into several classes as follows: State highways; provincial or country roads; city roads or streets; and rural district roads. The State highways form the general arteries of the country with the capital as the center and are maintained by officials of the Department of Bridges and Roads of Belgium, under the direction of the minister of public works. Their maintenance is met by the State and costs $150 per mile for paved road, $112.80 for macadamized highway in flat country, $293.75 for paved highway, and $180.75 for macadamized roads in rough country. In Germany the price per mile of road is estimated at $213.50 and in France $434.55 for paved roads and $184.55 for macadamized roads.

The provincial highways are the next important roads, connecting the towns with one another and with the State roads. Each province has control of these roads and maintains them. The city roads are, of course, built and maintained by the several cities. All the remaining minor roads are termed district roads. At the present time there are no statistics regarding these roads except in the Province of Hainaut, where, in 1900, there were 1,406 miles of paved road and 1,814 miles of macadamized road upon which has been spent, since 1830, $13,350,125. It is from these figures that the estimates for the rest of the provincial roadways of the kingdom were made, inasmuch as Hainaut forms one-sixth of Belgium in population and one-eighth in area. The State grants subsidies to aid in keeping the provincial roads, since 1841 these having amounted to $29,000,000. In 1896 a special fund of $2,000,000 was set apart, one-fourth of which was to be spent on the provincial and the rest on State roads. The provincial authorities are also permitted at times to declare district roads "highways of important communication," prescribe rules for their maintenance and distribute the cost among the different communes benefitted.

If present plans are carried out, considerable modifications will be made in the management of the roads, the tendency being towards co-operation. There will be more central supervision with nearly the same amount of local control as at present. The roads are not built in the best manner nor of selected material except in certain parts and improvement in these directions are to be sought.

OFFICERS OF THE SOCIETY



1, C. H. Rust, president; 2, George M. Ballard, 1st vice-president; 3, A. Prescott Folwell, 2nd vice-president; 4, Edwin D. Logsdin, 3rd vice-president; 5, George W. Tillson, secretary; 6, P. J. O'Brien, treasurer.

SOCIETY OF MUNICIPAL IMPROVEMENTS

THE American Society of Municipal Improvements will hold its tenth annual convention at Indianapolis on October 20th to 22nd inclusive. As many readers of the MUNICIPAL JOURNAL AND ENGINEER are aware, the objects of this society are similar to those of the League of American Municipalities. It deals, however, with the more technical questions of engineering work connected with the construction and maintainance of the modern city. Up to the present time, its methods of study, and treatment of the various subjects brought up for consideration, have been more resultful in producing a helpful volume, in its annual proceedings, than those employed by similar societies.

DOES SUPERIOR WORK

The principal reason for this mark of superiority of its work, as compared with other organizations, is found in its practice of appointing permanent and special committees, whose duty it is to devote special atention to the various subjects consigned to them through the year. There are permanent committees on street paving, electric street lighting, sewerage and sanitation, water works and water supply, taxes and assessment, city government and legislation, disposition of garbage and city cleaning, municipal franchises and an annual review of municipal progress. Special committees are appointed annually to consider some special feature upon which the society wishes an authentic report. This orderly way of treating municipal problems has not failed to produce annual volumes of proceedings, which are of more than ordinary value to city officials, and, as a consequence, there is a constant call for bound copies of the proceedings of the society.

MEMBERSHIP MORE THAN A HUNDRED

The membership of the society represents more than one hundred cities, besides having an extensive membership among manufacturers, contractors, engineers and individual city officials.

At the approaching convention there will be reports from standing committees upon the various subjects enumerated above, besides some special reports and special papers dealing with some other phases of municipal work.

Although the invitations sent out are usually limited to the members, it is generally understood that any person, whether he be a city official, engineer, contractor or otherwise, will be heartily welcome, and, if he so desires, given the opportunity to become a member, upon the payment of $5.00. The full programme has not yet been arranged. Any of our readers who desire further information about this meeting can secure it by corresponding with Mr. George W. Tillson, Municipal Building, Brooklyn, N. Y., who is the secretary.

The leading article in this number is devoted to Indianapolis, in which its civic beauty, commercial enterprise and principal features are well described by Mr. Theodore A. Randall, Editor of "The Clay Worker," Indianapolis.

HEADQUARTERS AT HOTEL ENGLISH

The local committee has arranged to have the headquarters during the convention at Hotel English, which faces on the circle, the most attractive business portion of the city, and convenient to all stations. Delegates and members should apply at once to the proprietor of Hotel English for rates and reservation of rooms. The hotel is modern in all its appointments, well heated, lighted, equipped, and managed, so that the comfort and convenience of all its guests are assured.

The usual courtesy of the railroads will be extended to all members attending, and it is hoped that no delegate will neglect to inquire for special railway certificate when he purchases his ticket. Last year, the members were unable to secure the benefits of a reduced fare, owing to the fact that not enough of the members secured a certificate when they purchased their ticket for the place of meeting. This year, it is hoped there will be more than the required number of certificates so that the members can secure the benefit of the reduced fare. Full particulars can be had on application to Secretary Tillson at the address above given.

PRELIMINARY PROGRAM

Tuesday Morning—October 20th

Address of Welcome and Response.
Annual Address of the President.

Tuesday Afternoon

Report on Street Paving, Nelson P. Lewis, Chairman.
Report on Electric Street Lighting, Edwin A. Fisher, Chairman.
Report on Sewerage and Sanitation, A. Prescott Folwell, Chairman.

Tuesday Evening

Banquet.

Wednesday Morning—October 21st

Report on Taxation and Assessment, George M. Ballard, Chairman.

Report on City Government and Legislation, John Rowson, Chairman.

Report on Disposition of Garbage and City Cleaning, John H. Emigh, Chairman.

Wednesday Afternoon

Report on Municipal Franchises, William S. Crandall, Chairman.
Report on Municipal Progress, Prof. A. N. Talbot, Chairman.
Report on Municipal Data and Statistics, Charles C. Brown, Chairman.

Wednesday Evening

Papers descriptive of Indianapolis.

Thursday Morning—October 22nd

Report on Park Development and Maintenance, G. A. Parker, Chairman.
Election of officers and general business.

Thursday Afternoon

Excursion.

KREODONE WOOD BLOCK PAVEMENTS

The Scientific Development of the Wood Block Pavement—Coming into General Use—Mayor Harrison, of Chicago, Highly Commends It

By Our Special Correspondent

THERE is a rapidly increasing demand for the modern wood block pavement among municipal officials, who are responsible to their constituents for the kinds of pavements laid, as well as among the property owners who pay for the pavements, and the owners and drivers of vehicles who use the streets. The even, smooth, and non-slippery surface, affording a perfect foothold for horses and presenting the least resistance to traction, are the qualities appealing to drivers. Recent inquiries among drivers of various kinds of vehicles, as to their opinions of the desirability of the different kinds of pavements, have shown that out of 1,017 answers received, 51 favored asphalt, 197 favored granite, 219 favored macadam, and 750, or nearly three-fourths of the whole number, favored wood blocks.

SCIENTIFIC DEVELOPMENT OF WOOD PAVEMENT

The development of the modern wood black pavement has only been accomplished by years of scientific study and experimenting. The known preservative qualities of dead oil of coal tar, commercially caller creosote oil, being recognized, these experiments have been directed towards securing a dead oil of coal tar that was absolutely uniform in quality, non-volatile and non-soluble.*

THE PAVEMENT SHOWN TO BE IN PERFECT CONDITION

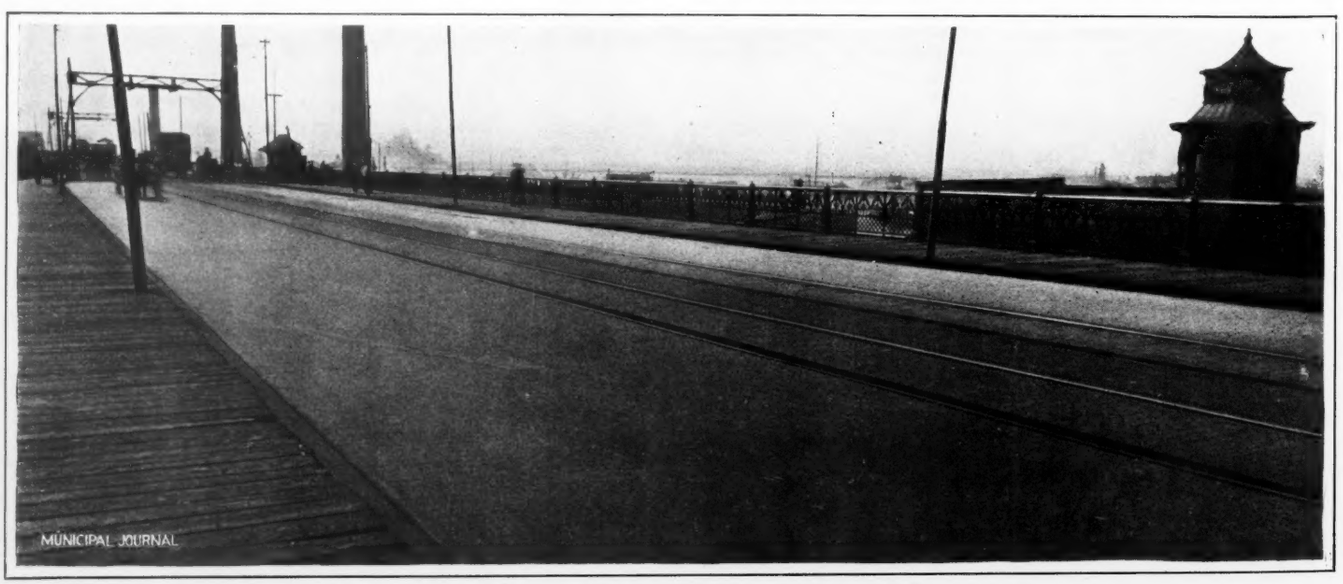
That Kreodone paving oil is non-volatile, and non-soluble has been so conclusively demonstrated in recent tests conducted by the city of Indianapolis that the Board of Public Works, upon the recommendation of the City Civil Engineer Nelson, awarded a paving contract to the Hoosier Construction Company, using long-leaf yellow pine blocks, impregnated with Kreodone, though this company was the highest bidder by 14 cents per lineal foot of pavement. The tests upon which the recommendation of the engineer and the award were based, were conducted by City Chemist Dr. Ansil Moffatt, the well-known technological expert, assisted by Mr. Walter Buehler, assistant city engineer, a graduate of Purdue University and of the Colorado School of Mines.

Blocks impregnated with Kreodone paving oil showed absolutely no variation in area of exposed surface and no variation in weight after these tests. Blocks treated with other oils showed a marked variation both in area of exposed surface and in weight. These tests entirely substantiated the claims made by its manufacturers for the Kreodone oil that blocks impregnated with it are rendered non-absorbent and non-expansible.

KREODONE WOOD PAVEMENTS HIGHLY ENDORSED

Engineers and others, whose technical and scientific knowledge has enabled them to fully appreciate the correctness of the scientific principles involved in the production of Kreodone paving oil

* A series of experiments extending over a period of years, conducted by the Republic Chemical and Creosoting Co., of Indianapolis, has resulted in the production of such an oil. The Kreodone paving oil produced by this company is a specially prepared and treated dead oil of coal tar in which the defects of common creosote oil, as a wood preservative, have been entirely overcome. The result is a paving oil that is not only a perfect and permanent preservative but one that also materially increases the natural toughness of the wood treated with it. This quality of Kreodone is clearly shown in the treatment of long-leaf yellow pine blocks with it for paving purposes. This timber, in its natural state, has a resistance to crushing strength of about 8,500 pounds to the square inch. Treated with Kreodone paving oil, it has a resistance of 10,000 to 11,000 pounds.



SUPERIOR STREET VIADUCT, CLEVELAND, O.—LAID IN 1900

and the construction of Kreodone wood block pavements, have strongly endorsed them. On the other hand, property owners who have observed these pavements under the heaviest traffic in Indianapolis, St. Louis, Duluth, Minneapolis, Cleveland, Toledo, Terre Haute, Chicago, and all cities where they have been laid, readily appreciate their durability, cleanliness, noiselessness, ease of traction, beauty and their especial fitness for either a residence street or a heavily traveled business street.

In referring, in a recent letter, to the Kreodone wood block pavement laid in Cleveland, City Engineer William J. Carter, of that city, said: "The Kreodone block pavement laid on Superior Street viaduct in 1900, is in first-class condition at the present time. The block is subjected to probably the heaviest travel we have in this city, being on the main artery between the east and west sides." Two views of this pavement are shown herewith.

REMARKABLE DURABILITY

A remarkable demonstration of the durability of the Kreodone pavement is to be observed on the Rush Street Bridge, Chicago. Mayor Harrison has referred to it in each of his three last annual messages. It carries the heavy traffic from the wholesale district, the river docks and railroad freight houses. Accurate count has shown the number of vehicles—chiefly heavy trucks and vans—passing over it, to be in excess of 11,000 daily. It was laid in 1899, and is now in perfect condition and has had no repairs. The first two and a half years showed a uniform wear of only one-eighth of an inch, and, though no measurement has been recently made, it is safe to say that it now will show no greater wear than one-fourth to three-eighths of an inch. And the wear has been so uniform that the pavement retains its original smoothness—there are no ruts or bad spots in it.

The pavements referred to were made of long long-leaf yellow pine blocks, impregnated with only twelve pounds of oil to the cubic foot; some cities require from eighteen to twenty-two pounds to the cubic foot.

BRICK PAVEMENTS*

Brief Description of Their Origin and Qualities—Hardness, Toughness and Strength—Homogeneity and Uniformity—Imperviousness to Moisture, and Density

By George W. Tillson, C. E.

ABRASION TEST

This was under the direction of Prof. Edward Orton, Jr., who, after making an exhaustive set of experiments with the rattler to determine the proper dimensions, rate of speed, and duration of test, reported the results to the convention.

Mr. F. F. Harrington of St. Louis, also made a series of tests on practically the same lines, the results of which agreed very closely with that of Prof. Orton and which were presented to the convention at the same time.

Table No. 66 shows the effect and degree of loss of vitrification, and the rate of loss by rattling, as determined by Mr. Harrington.

TABLE NO. 66

Description.	Per cent. of Loss.			
	10 Min.	25 Min.	40 Min.	60 Min.
Overburned	3.64	9.20	14.53	19.57
Well-burned	2.48	6.64	9.54	11.70
Underburned	7.20	13.33	17.71	22.99
Average	3.50	9.75	14.10	17.50

Considering the charge to be placed in the rattler, Prof. Orton experimented with brick only in the rattler, with brick and cast-iron blocks, and also with bricks and blocks of stone. From the different results obtained he decided that the most satisfactory method was with a charge composed of brick only. The following specifications for the standard method of conducting the rattling test were adopted by the convention:

1. *Dimensions of the Machine.*—The standard machine shall be 28 inches in diameter and 20 inches in length, measured inside the rattling-chamber. Other machines may be used varying in diameter between 26 and 30 inches, and in length from 18 to 24 inches; but if this is done, a record of it must be attached to the official report. The rattler may be cut up into sections of suitable length by the insertion of an iron diaphram at the proper point.

2. *Construction of the Machine.*—The barrels shall be supported on trunnions at either end. In no case shall the shaft pass through a rattler-chamber. The cross-section of the barrel shall be a regular polygon having fourteen sides. The heads and staves shall be composed of gray cast iron, not chilled or case-hardened. There shall be a space of ¼ of an inch between the staves for the escape of dust and small pieces of waste. Other machines may be used having from twelve to sixteen staves, with openings from ⅛ to ⅜ of an inch between the staves; but if this is done, a record of it must be attached to the official report of the test.

3. *Composition of the Charge.*—All tests must be executed on charges composed of one kind of material at a time. No test shall be considered final where two or more different bricks or materials have been used to compose the charge.

4. *Quantity of the Charge.*—The quantity of the charge shall be established by its bulk and not its weight. The bulk of the standard charge shall be equal to 15 per cent. of the cubic contents of the rattler-chamber, and the number of whole brick whose united volume comes nearest to this amount shall constitute the charge.

5. *Revolutions of the Charge.*—The number of revolutions for a standard test shall be 1800, and the speed of rotation shall be 30 per minute. The belt power shall be sufficient to rotate the rattler at the same speed whether charged or empty. Other speed-rotations between 24 and 36 revolutions per minute may be used; but if this is done, a record of it must be attached to the official report.

6. *Condition of the Charge.*—The bricks composing the charge shall be dry and clean, and as nearly as may be possible in the condition in which they were drawn from the kiln.

7. *Calculation of the Results.*—The loss shall be calculated in the per cents. of the weight of the dry brick composing the charge, and no result shall be considered as official unless it is the average of two distinct and complete tests made on separate charges of brick.

Prof. A. N. Talbot of the University of Illinois has also made some important investigations in this line, and he takes issue with the conclusion of the Brick Manufacturers' Association in the adoption of brick alone for the rattler-charge. In addition to the brick themselves he adds a charge of standard foundry shot, consisting of cast-iron blocks of two sizes, the larger being 2½ × 3½ × 5¼ inches, with edges rounded to ½-inch radius, weighing about 8 lbs. each, and the smaller size 1 × 1½ × 2½ inches, with rounded edges, weighing about 1 lb. From his experiments he adopted as the standard charge for a 24 × 36-inch rattler 150 lbs. of the 8-lb. shot and 150 lbs. of the 1-lb. shot. He concludes that by this method it makes no difference how many bricks, within reasonable limits, are used in a test; that from 5 to 14 bricks may be tested and the percentage of loss will remain nearly constant. His objection to the test proposed by the Brick Manufacturers' Association is that it requires a great many bricks for a satisfactory test, and that this means that the results will be materially affected; also that

* This is the second of a series of four articles on "Brick Pavements," by Mr. George W. Tillson, Chief Engineer of the Borough of Brooklyn. It is a reprint of the chapter on that subject from his valuable work on "Street Pavements and Paving Materials," published by John Wiley and Sons, New York. The complete work has 532 pages, octavo in size, bound in cloth, and sells for $4.00. *Copyright, 1900, by George W. Tillson.*—[EDITOR.

the method will not distinguish sufficiently between soft and brittle brick, the idea being that the brittle brick by impact would show as much loss as soft brick by abrasion. He made a series of tests at the University of Illinois, using his and the manufacturers' standard, with brick whose characteristics were well known, and concluded from the results that the University of Illinois method is better.

Mr. Gomer Jones, City Engineer of Geneva, N. Y., has patented a rattler for testing paving-brick which he thinks is superior to those previously in use. His idea was that the ordinary rattler method gives the result of impact upon the brick rather than the abrasion, and his machine was designed to correct this evil. A paper read before the National Brick Manufacturers' Association in February, 1899, described it as follows:

"The machine is a rattler with the usual driving-gear and accessories, differing from the ordinary rattler only in that, instead of plain staves, it is provided with staves having two longitudinal pockets in which the bricks are inserted and held end to end. These pockets are 3 inches deep, leaving about 1 inch of the brick protruding. When all the staves are in, the interior of the rattler is virtually a solid brick line. During rotation the touch of the abrading material is at right angles to the length of the brick and confined to the surface and edges which are exposed in actual use. There is sufficient space between the brick for the escape of any dust or waste, and incidentally to allow the abrading material free access to the unsupported edges of the brick under test, reproducing the conditions of position and line of wear found when the brick are laid with sand filler on the street. In selecting abrading material, the first point to be decided is the amount of wear or abrasion desirable. My opinion is that the abrasion should be of such amount that at the end of the test the weakest brick shall be in a condition similar to that in which the brick worn out on the street are found.

"I will not enter into details of the exhaustive experiments that led to the adoption of the cast-iron cube 1½ inches square, weighing 87/100 of a pound, as the unit, and 150 lbs. of such cubes as the charge, but will simply state that when subjected to 3,000 revolutions the bricks considered standard lost 50 per cent. of weight, and would be condemned if found on the street."

The rattler used by Mr. Jones was 24 inches in diameter. There is no question but that his apparatus subjects the brick more nearly to conditions similar to what it receives on the street than that of the ordinary rattler; and as in all tests the conditions should be made as nearly as possible like those under which the material is subjected in the work, the method is to be commended. The principal thing, however, to be obtained is to have a test that will be standard, that will distinguish the different defects of the different kinds of brick, and by a method that can be repeated in different cities with practically the same results. This Mr. Jones expects to effect by his machine, and it would seem that his expectations were justified. In a test of certain kinds of brick and cut Medina stone blocks made by him with his machine, the losses were as follows:

	Per cent.
Shale block	2.46
Medina stone block	3.61
Fire clay block No. 2	3.2

On account of these differences, a committee was appointed by the National Brick Manufacturers' Association for further investigation, and, in consequence of its report to the convention in 1900, sections 3, 4, and 5 were modified to read as follows:

3. *Composition of the Charge.*—All tests must be executed on charges containing but one make of brick or block at a time. The charge shall consist of nine paving-blocks or twelve paving-bricks, together with three hundred pounds of shot made of ordinary machinery cast iron. This shot shall be of two sizes, as described below, and the shot charge shall be composed of one-fourth (75 pounds) of the larger size and three-fourths (225) pounds of the smaller size.

4. *Size of the Shot.*—The larger size shall weigh about 7½ pounds and be about 2½ inches square and 4½ inches long, with slightly rounded edges. The smaller size shall be cubes of 1½ inches on a side, with rounded edges. The individual shot shall be replaced by new ones when they have lost one-tenth of their original weight.

5. *Revolutions of the Charge.*—The number of revolutions of a standard test shall be 1,800, and the speed of rotation shall not fall below 28 nor exceed 30 per minute. The belt-power shall be sufficient to rotate the rattler at the same speed whether charged or empty.

It was also recommended in the construction of the rattler that the staves be made of steel on account of the rapid wear of the cast iron.

ABSORPTION TEST

An investigation in regard to this test was also made by Mr. Harrington. He experimented in a great many different ways, and his conclusions were the result of very careful study, as is shown in detail in his report.

In order to bring the samples to the proper standard of dryness, they were kept in an oven that was constantly maintained at a temperature of from 220° to 240° Fahr.

Table No. 67 shows the results of his investigations in that respect, and the following are his conclusions:

"This chart shows that it requires four days to dry the samples of brick completely and thoroughly, even when the temperature is maintained constantly above the boiling-point of water. This shows how complex and tortuous the pore-channels through the mass of the brick must be, since the water exhausted in them must be superheated and under pressure for the entire time of the test; but while 96 hours is necessary to complete the drying, still the amount of moisture lost in the last half of this treatment is the very small amount of only 5.9 per cent. of the total quantity evaporated. For practical work the gain in time of 48 hours on a test is worth more than the reduction to absolute drayness."

TABLE No. 67

Percentages of Water Evaporated.

Brand of Brick.	2 Hours Drying.	6 Hours Drying.	24 Hours Drying.	48 Hours Drying.	96 Hours Drying.	168 Hours Drying.
Alton Paving-brick Co., Alton, Ill.	.070	.085	.1.20	.135	.135	.135
St. Louis Pressed-brick Co., St. Louis, Mo.	.065	.205	.232	.260	.260	.260
Standard Paving-brick Co., St. Louis, Mo.	.210	.320	.395	.525	.535	.535
Purington Paving-block Co., Galesburg, Ill.	.065	.095	.130	.130	.145	.145
Barr Clay Co., Streator, Ill.	.075	.115	.168	.190	.220	.220
Townsend Paving-brick Co., Zanesville, O.	.030	.062	.095	.110	.130	.130
Moberly Brick Co., Moberly, Mo.	.040	.195	.312	.330	.355	.355
Galesburg Paving-brick Co., Galesburg, Ill.	.035	.090	.120	.155	.155	.155
Galesburg Brick & T.-C. Co., Galesburg, Ill.	.055	.055	.112	.112	.130	.1330
	.045	.060	.087	.120	.120	.120
Average	.065	.127	.178	.210	.220	.220

TABLE No. 68

Percentages of Water Absorbed.

Brand.	1 Day.	2 Days.	7 Days.	2 Weeks.	4 Weeks.	6 Weeks.	8 Weeks.	12 Weeks.	24 Weeks.
Alton Paving-brick Co.	0.37	0.55	0.65	0.80	1.05	1.29	1.51	1.62	1.73
St. Louis Pressed-brick Co.	0.36	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.45
Standard Paving-brick Co.	0.44	0.55	0.60	0.70	0.76	0.87	0.96	1.02	1.12
Purington Paving-brick Co.	0.87	1.48	1.76	1.95	2.05	2.20	2.28	2.31	2.48
Barr Clay Co.	0.25	0.80	1.60	2.10	2.30	2.60	2.70	2.74	2.87
Townsend Paving-brick Co.	0.28	0.37	0.48	0.62	0.83	0.87	1.00	1.05	1.20
Moberly Brick Co.	1.60	2.65	3.10	3.90	4.10	4.26	4.35	4.55	4.62
Wabash Clay Co., Veedersburg, Ind.	4.60	5.30	5.63	5.87	6.10	6.20	6.35	6.40	6.58
Mack Pav.-brick Co., Pittsburg, Pa.	3.12	3.63	3.87	4.02	4.18	4.20	4.29	4.32	4.35
Imperial Pav.-brick Co., Canton, O.	0.25	0.35	0.37	0.58	0.70	0.85	1.04	1.18	1.28
Des Moines Paving-brick Co., Des Moines, Ia.	0.60	0.75	0.76	1.03	1.25	1.45	1.62	1.73	1.87

* Passing 100-mesh.

Table No. 68 shows the percentages of water absorbed at different intervals of complete immersion.

On another test made with samples from which both ends had been broken, leaving practically half of the brick, the result showed a considerable gain over that for which the whole brick was used. Experiments were also made with small chips from the interior of the bricks which showed the same line of facts as the previous experiment. He concludes that it is doubtful if it would be possible to get complete saturation even if the bricks were first put into the vacuum-chamber and the gas from their pores exhausted. The

average increase of absorption of the half-bricks over the whole ones was found to be 16½ per cent. in 24 weeks, and the average increase of small pieces over half-bricks and whole bricks in eight weeks was respectively 47.3 and 66.1 per cent. Mr. Harrington favors the use of the brick which have first been used in the rattler test, because the action of the water by absorption takes place quicker with such brick, and also for the reason that they are in practically the same condition as the brick that are exposed in a pavement. His reports having been presented to the commission and discussed, the following points were agreed upon by all:

"1. That all the evidence showed that all data obtained in any short test of less than one week is far from representing the actual porosity of the brick.

"2. That the results of short tests are misleading, because the rates of absorption of different samples are widely different.

"3. That in the experience of members of the commission no connection whatever can be traced between a low absorption test and materials of wearing quality in paving-brick.

"4. That paving-bricks which are soft enough to become liable to destruction by frost showed this structural weakness in the rattler test also."

Consequently the commission decided officially to discontinue the absorption test as a means of determining the value of paving-bricks; but for the benefit of those who might still adhere to its use, the following specifications for conducting the test were adopted:

"1. *Number of Brick.*—The number of brick constituting sample of the official test shall be five.

"2. *Condition of the Brick.*—The brick selected for conducting this test shall be such as have been previously exposed to the rattler test. If such are not available, then each whole brick must be broken in halves before the test begins.

"3. *Drying.*—The brick shall be dried for 48 hours continuously at a temperature of 230° to 250° Fahr. before the absorption test begins.

"4. *Soaking.*—The brick shall be weighed before wet, and shall then be completely immersed for 48 hours.

"5. *Wiping.*—After soaking, and before reweighing, the bricks must be wiped until free from surplus water and practically dry on the surface.

"6. *Weighing.*—The samples must then be reweighed at once. The scales must be sensitive to 1 gram.

"7. *Calculation of Result.*—The increase in weight due to absorption shall be calculated in per cents of the dry weight of the original bricks."

The commission then adopted the following resolution and attached it to the above as a part of their report:

"Resolved, that, in the opinion of this commission, any paving-brick which will satisfy reasonable mechanical tests will not absorb sufficient water to prove injurious in service. We therefore recommend that the absorption test be abandoned from all official tests as unnecessary, if not absolutely misleading."

(TO BE CONTINUED IN NOVEMBER.)

SAND CEMENT- AND SAND LIME-BRICK*

The Early History of the Industry—Better Than Old Style of Clay Brick—Adapted to All Kinds of Building Purposes

By Paul Tafel, C. E.

THE first sand-lime brick was made in Germany by mixing common sand with about a quarter of its weight of slaked lime, by moulding the mass into bricks or blocks and by curing the latter in the open air. The hydrate of lime was thus gradually converted into carbonate of lime, so that the sand particles became, in the course of time, surrounded by a solid and coherent mass which gave the brick or block a stonelike hardness. The principle was the same as that underlying the hardening of ordinary lime mortar and the brick for this reason received the appropriate name of "mortar brick."

This method of Brick making was carried out in various places, but on rather a small scale, until the beginning of the seventies, when Prof. Michaelis of Berlin, after many years of scientific research, pointed out that sand-lime brick can be given a hardness equal to that of the best pressed clay brick, in as many hours as weeks are required by the open air method, by subjecting the moulded brick to the effect of high pressure steam. It is important to note that by this process the hydrated lime is not converted into carbonate of lime by taking up carbon dioxide from the atmosphere, but that instead it directly combines with the silica of the sand itself, so that the sand particles are not mechanically imbedded in a mass of carbonate of lime, as was the case in the mortar brick mentioned above, but chemically bonded together, the bonding element being a very stable compound, "hydrosilicate of lime."

It is of the utmost importance to prevent the presence of carbon dioxide by all possible means during the entire process, as its effects would be detrimental to the quality of the brick, no matter whether the carbon dioxide is in the free state (in the atmosphere or in the water), or, in the combined state, as in soda or potash, for instance. And since the affinity, or, to use a more popular expression, the desire to combine, between lime and carbon dioxide is very considerable and since the quality of the brick is the better the more silicate is contained therein, it is obvious that its compressive strength will be the smaller, the larger the quantity of lime which had been allowed to combine with carbon dioxide and therewith to become unavailable for the formation of silicate of lime.

If, however, the manufacturing process is being properly carried out and if due measures of precaution are being taken to prevent the paralyzing effects of carbon dioxide in the lime, sand-lime brick when leaving the hardening cylinder, is a dense and tough material of high compressive strength and ready for immediate shipment; it is able to withstand extreme frost and high degrees of heat as well as the injurious effects of any acids that may be contained in the atmosphere, especially in that of large cities and manufacturing districts, or in the waste waters carried off in sewerage or canalization conduits.

The color of sand-lime brick is white, sometimes pure and uniform like Carrara marble, sometimes softly tinted according to the original color of the sand; it is for this reason highly susceptible to the coloring effect of any pigment that may be added to the raw mass before it goes to the presses. It can be made in any size or shape for ornamental purposes and Terra Cotta effects and it has the great advantage over burned products of this class that during the hardening process it will retain its smooth surfaces and its sharp and even edges.

These qualities at once raise sand-lime brick to the level with the best products of the clay-brick industry; it far excels its would be rival, the "sand-cement brick."

Interesting information on the sand-lime brick industry, especially on the different methods and systems of making sand-lime brick, will be found in a little book entitled "Silico-Calcareous Sand-Stones," by E. Stoeffler of Zurich, Switzerland, an eminent European authority on the various classes of building materials.

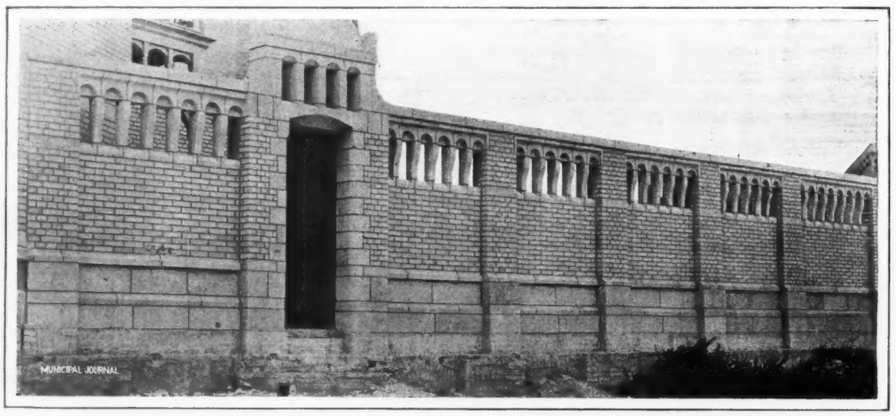
We shall therefore conclude this paper by briefly considering these two comparatively new building materials, "sand-lime brick and sand-cement brick" in the light of comparison.

The raw materials are sand and lime for the former, sand and

* The first part of this article appeared in the September number.

cement for the latter. In either process, in order to obtain a perfectly intimate and homogenous mixture, the sand must first be deprived of its moisture, then a certain quantity of lime or cement is added—weighed, in order to secure uniformity and in order to obtain the correct proportion; finally, a carefully measured amount of water is injected to moisten the raw masses for the presses. All these different phases are preferably executed by a single machine for the purpose of saving power and labor and to insure uniformity of the product at all times of the day or year.

After the brick or blocks have been taken from the presses, they are ready for curing or hardening. It is in this latter process mainly where the two methods of manufacture differ. Sand-lime brick is subjected, as has been stated above, to the effects of high pressure steam for a period of from six to ten hours and is then ready for immediate shipment. Sand-cement brick is conveyed into a steam chamber or hot room where in the presence of humid air, obtained by means of water sprays and exhaust steam, the setting and initial hardening takes place. Thence, the bricks are taken to the storage sheds where they remain until their hardness is sufficient for building purposes, and by the time they are ready for shipment, the sand-lime brick which passed through the presses on the same day, may be resting safely in the walls of a building where they have been laid weeks and probably months ago.



SAND-LIME BRICK RETAINING WALL AT THE PRAGUE*

Another important difference is the following feature. While the quantity of sand-lime brick principally depends on the method by which the raw mass had been prepared and on the completeness of the reaction in the hardening cylinder; i. e., the formation of hydrosilicate of lime by means of steam heat, that of sand-cement brick is determined first and foremost by the quality of the Portland cement used.

The time of setting and the time during which the material reaches a certain tensile and compressive strength is different for every brand of Portland cement and even varies within more or less wide limits in the product of the same plant. It is therefore necessary to test each shipment before use and the period of observation must, if the results be reliable and conclusive, extend to a period of no less than four weeks. There is further to be determined the constancy of volume, and, at least for sand-cement brick for ornamental purposes, the constancy of color and the possibility of the formation of salts on the surface (efflorescence).

In every engineering enterprise where large quantities of Portland cement are to be employed the cement testing laboratory forms an important part of the outfit; it is of equal importance in the manufacture of sand-cement brick.

All this may be omitted in the manufacture of sand-lime brick. The chemical and physical analyses of the different specimens of lime vary, of course, with the different quarries where they originated, but are, as a rule, thoroughly uniform from the same quarry; the effects of small variations in the lime on the quality of the brick manufactured therefrom are insignificant, owing to the small percentage in which the lime is added to the sand. After the quality of the lime has once been ascertained and the mixing proportion for a given specimen of sand has been determined, the manufacturer can proceed to make brick without ever changing his formula. A controlling test made from time to time, to ascertain whether the conditions have remained the same, is all that is required. Besides, the hardening process of sand-lime brick is, in itself, the most vigorous test to which any building material of this class can be subjected, so that, after the brick has emerged from the hardening cylinder in good form and of sufficient compressive strength, its suitability for building purposes is conclusively demonstrated.

In other words, the manufacturer of sand-lime brick can afford to rely on the efficiency of his plant and on the competency and skill of the man in charge of the same, while the sand-cement brick maker who does not wish to go to the trouble and expense of a testing laboratory, is, to a considerable extent, dependent on an outside party: the manufacturer or dealer of Portland cement.

There remains the economical side of the question yet to be considered.

The cost of equipping a sand-lime brick plant of a capacity of 25,000 brick per ten hours with the best machinery obtainable is in the neighborhood of $26,000. This equipment comprises the power plant and transmission, the lime pulverizing plant, the machinery for preparing the raw materials, the presses, the hardening cylinders and the various appliances for transporting fuel, raw materials, green and finished brick. The space covered by a plant of this capacity is about one hundred square feet.

A well-equipped sand-cement brick factory of equal capacity costs approximately the same. The power plant can be of a smaller capacity, for there is no lime pulverizing machinery to be driven and no live steam to be furnished for hardening the brick. Furthermore, the cost of the heating chambers (square rooms, open at the top, fitted with a number of racks for the brick pallets) is considerably below the cost of the ahrdening cylinder required for sand-lime brick. Also, as the brick are tken from the presses on pallets and immediately carried or carted into the hot rooms, while sand-lime brick must be placed, one by one, on especially constructed flat cars and exposed to the the steam with the car, so that for every thousand brick one car is needed, this item is likewise in favor of sand-cement brick. But, on the other hand, the manufacture of the latter necessitates the erection of substantial silos or bins for storing at least one month's supply of Portland cement, of a well equipped physical and preferably also chemical testing laboratory and a large number of spacious storage sheds, sufficient to hold the output of several months. The area covered is for this reason many times larger than that required for a sand-lime brick factory, a point which must not be overlooked, especially in the neighborhood of large cities where property is of greater value.

A comparison of the cost sheets leads us to the following interesting deductions, the comparison being based, of course, on the assumption that both plants are operating under equal conditions. This relates to capacity, contiguity to raw materials and fuel, kind and cost of fuel, efficiency of power plant, and machinery in general, kind and cost of labor, means and cost of transportation to and from the plant, value of property, taxes, insurance rates, climatic conditions, etc., etc.

(1) Depreciation of plant: Approximately equal in either case.

(2) Raw materials: The price of Portland cement at the present time is more than twice that paid for an equal weight of lime, while the amount of cement added to the sand in order to obtain a good sand-cement brick is at least three times larger than the percentage of lime required in the manufacture of sand-lime brick, and since in the latter industry the quality of the product is in most cases improved

* This illustration shows a retaining wall at The Hague which is constructed with sand-lime brick, made by the same methods and machinery as those employed by The Schwarz-System Brick Company, 10 Bridge St., N. Y. City, by whose courtesy we reproduce the above.—[Editor.

by decreasing the percentage of lime, as far as the cohesive capacity of the green brick will permit, and since on the other side the compressive strength of sand-cement brick is the greater, the more Portland cement is contained in the same, the charges for raw material in the manufacture of sand-cement brick will be far above those of sand-lime brick.

(3) Fuel: The amount of fuel for hardening sand-lime brick in steam of one hundred and twenty-five pounds per square inch pressure is approximately 40 per cent. of the total fuel consumption, provided that the hardening cylinders and the pipes connecting the same with the boilers are well protected.

This figure constitutes the excess of fuel needed in the manufacture of sand-lime brick over that required for sand-cement brick—the charges of fuel, however, are much below those for labor and raw materials.

(4) Labor: A sand-cement brick factory requires a larger working force on account of the necessity of storing the finished product before it can be shipped. A further addition to the pay-roll accrues through the man in charge of the testing laboratory, an experienced and therefore higher priced person whose services are, as stated, not required in a sand-lime brick factory.

(5) General expenses: Including office, taxes, interest on capital ontlay and stock on hand, fire insurance, accident insurance, etc. Larger for a sand-cement brick plant on account of the wider area subject to taxation and on account of the larger amount of stock—raw and finished—to be carried.

It is nothing surprising, therefore, that in actual practice the cost of manufacturing sand-cement brick is often twice as large as that of manufacturing sand-lime brick under the same conditions. The selling prices, however, of the two products are the same.

The sand-lime brick industry can well be said to have passed its experimental period and the state of its technical perfection is such as to enable manufacturers of sand-lime bricks, blocks or roofing tiles to successfully compete with similar wares of the clay or concrete industries. In Europe, and especially in Germany, thousands of private residences, school-houses, hospitals and even governmental buildings have been erected of sand-lime brick during the last two or three decades, and the fact that they have splendidly withstood the deteriorating effects of time and weather fully bears out the theory that sand and lime mixed in a certain definite proportion, pressed into bricks or blocsks or tiles and hardened in high pressure steam will form an excellent building material.

THE END

MUNICIPAL STONE CRUSHING PLANT

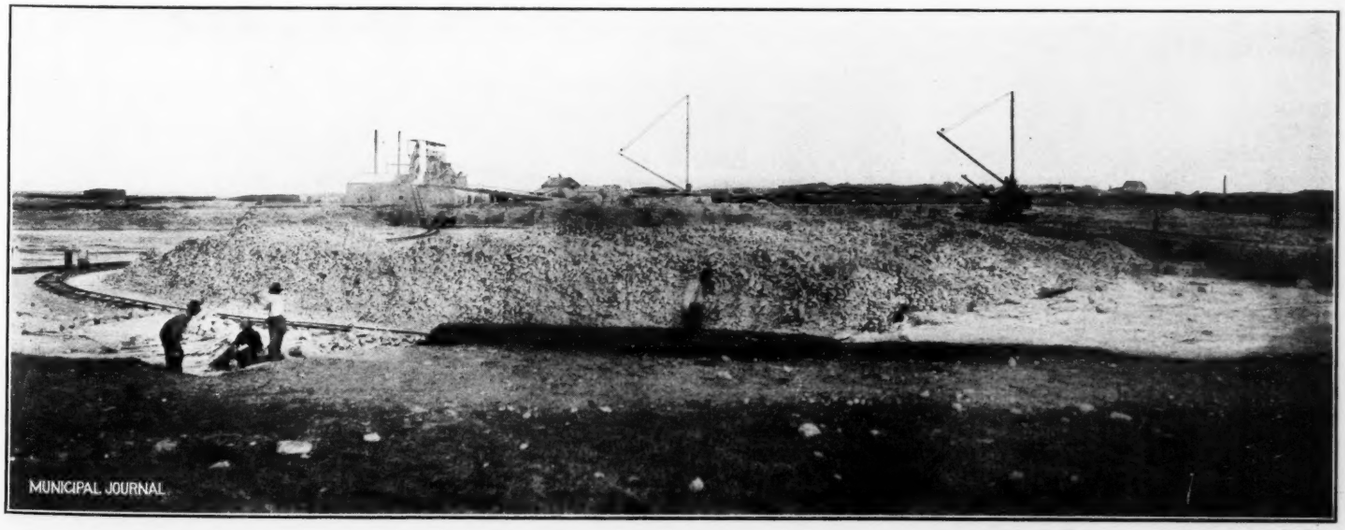
How Winnipeg Supplies Its Own Crushed Stone for Streets—Extensive Quarries Owned by City—A Progressive Municipality

By Our Special Correspondent

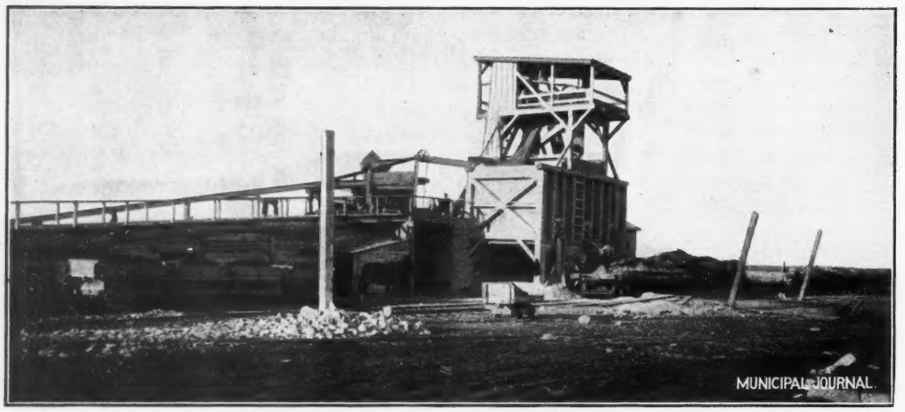
Municipal ownership of public utilities is fairly well exemplified in the city of Winnipeg, Manitoba. The city owns and operates its water and light plants, asphalt plant, garbage crematory and stone quarry, and, thus far, all have been successful. The city ownership of water and light plants, as well as of crematories, is not uncommon, but there are few cities that successfully operate a stone quarry. Bridgeport, Conn., owns a stone quarry, but has been unable to run it successfully, and not long since rented it to a contractor. Hamilton, Ontario, has done well with its stone quarry, but the supply of rock has become exhausted and the Council has been considering the purchase of two new quarries. Winnipeg has met with the greatest success in its operation of the quarry and the cost of the stone for the roads and public buildings of the city has been greatly reduced.

City Purchased Quarry in 1896

The municipal quarry of Winnipeg is located some six miles from the city and was started in 1897. The quarry was the property of Lord Strathcona, from whom the city purchased it in 1896 at forty dollars an acre. There are eighty acres in the property and it is very valuable for quarry purposes, inasmuch as the stone is blue limestone of good quality, and in many instances the outcrop is at the surface, thus making it easy of access. At no place is it necessary to strip more than five feet of the top soil before reaching the rock. No attempt has been made to sell the stone to outside parties and so the city has not gone into the business of "municipal trading," which is so objectionable to many people. All the stone used by the city in any way is supplied by the municipal quarry; broken stone for use in macadam and concrete pavements; limestone dust for use in laying asphalt, and the dressed stone for curbing come from the quarry. The granite dust that is used in making artificial stone walks and curbs and all the cut stone for the erection of public buildings is supplied. The granite dust is made from the boulders taken from the earth overlying the limestone, thus there is little or no waste. The quarry is nearly square in form and is worked in terraces, and



A PARTIAL VIEW OF WINNIPEG'S EXTENSIVE STONE QUARRIES



WINNIPEG'S STONE CRUSHER IN OPERATION

thus far the depth has not been more than thirty or forty feet, consequently the cost of getting out the stone has not been excessive.

Rapid Growth of Industry

One of the accompanying illustrations shows the large crusher plant that has been installed. When the quarry was opened a No. 4 Gates gyratory crusher was purchased, but the demands for stone became so great that it was necessary shortly afterward to supplement this with a No. 3 Gates crusher with a pair of twenty-inch rolls for producing granite dust. The growth of the city has been so rapid that the present plant has proved inadequate for supplying the necessary amount of stone for improving the streets, and in February last bids were asked by the authorities for a No. 7½ stone crusher. The combined capacity of these three crushers will be from one hundred to one hundred and seventy-five tons of rock per hour. The crusher plant is operated from the 1st of May to the 30th of November each year. The stone is loaded on flat cars at the quarry and is carried over what is known as the "Winnipeg & Little Mountain Railroad." This railroad is owned by the quarry and is two miles in length. It connects the quarry with the Canadian Pacific road and furnishes a direct means for getting its stone to the city stone yard at Winnipeg. Not long ago, when the Council was considering increasing the output of the quarry at a cost of about $10,000, it was suggested that the city build a railroad directly to the quarry. It costs the city about $10,000 a year for the freight on the stone and the estimated cost of a road would be $134,000. After considerable discussion it was not considered advisable for the city to undertake such an expensive project. It was suggested, however, that the city might purchase its own cars. While the capacity of the quarry is about twenty-five cars a day, only from eighteen to twenty-one care can be obtained from the railroad, and the consequence is that the quarry cannot be run at its full capacity, as it would not pay to stock the quarry yard with too large amount of stone until it was needed.

The output for 1892 was 36,700 yards of crushed stone; 33,466 linear feet of cut stone curbing; 18,328 feet of rough cut stone; 527 feet of headers and a large amount of rubble footings and dimension stone. The season's work amounted to $77,259.

The Quarry Management

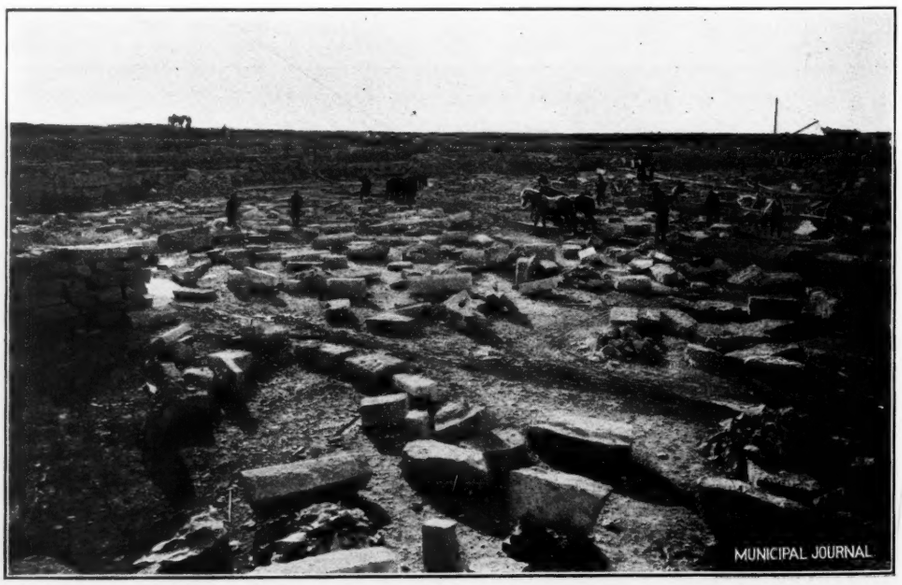
The quarry is in charge of a manager who is directly responsible to the Council. He acts in the same capacity as would an independent contractor who delivered stone to the city. The price is fixed on each of the different kinds of stone that are used by the city, and the stone is purchased free on board cars at the city yard in Winnipeg. There the stone is measured by the engineer's department and the quarry receives credit in the same manner as though it were a private concern. In this way its operations are kept entirely distinct from the rest of the city's work and officials are able to determine whether the undertaking is successful. The present manager, Mr. C. P. Kelpin, has been in charge of the quarry since 1898. Under him are three foremen, the first being in charge of the cut stone department, which includes the stonecutters' yard; the second is foreman of the quarry itself, and the last is foreman on the surface. The superintendent of machinery, Mr. W. R. Cahoon, has had charge of the plant since 1897, when it was first installed. The office staff is in charge of Mr. W. D. Murray, the accountant, who, together with Mr. Kelpin, look after the finances and general running of the plant.

In and about the quarry there are employed about one hundred and sixty men. These are paid from twenty cents to twenty-two and one-half cents per hour, and at present the working day is nine hours in length. The stonecutters receive about fifty cents an hour. When the quarry was purchased the region about was very sparsely populated, but a little settlement has sprung up about the offices and here the employees live with their families, and most of the men own their own houses. There are several boarding houses in the settlement where some of the men live at the exorbitant (?) rate of $3.50 a week. There are also two stores and a post office.

The life of the quarrymen is, in many respects, a very pleasant one, as compared with a similar class of workmen in the cities. They have formed what is known as the "Quarrymen's Protective Association," in which practically all of the men are included. The association has erected its own hall and reading rooms and its library has been largely supplied by the citizens of Winnipeg who are interested in the colony. Different races are represented, among them those of English, Irish, Scotch, Canadian, American and the Swedish nationalities being prominent. To keep their leisure hours from becoming monotonous various clubs for sporting purposes have been formed among the members of the Association, and these compete among themselves and with clubs from outside. The fellowship that is engendered by this close association of the men naturally conduces to good work in the quarry, and the management encourage every possible means of making the lives of the men happy.

Prices Paid for Quarry Stone

The prices charged for the stone from the quarry are placed as low



WHERE WINNIPEG GETS ITS BUILDING STONE

as is consistent with the idea of making the quarry self-sustaining. After paying interest on the investment and the sinking fund and all expenses, a comfortable balance is left every year. Therefore the taxpayers are receiving in return for their investment extremely low prices for stone and more streets can thus be repaired or built than if the city were compelled to pay a price that would include a profit for some contractor. The prices received for stone at the city yard in Winnipeg are as follows: Crushed stone, coarse, $1.10 per cubic yard; fine crushed stone, $1.00 per cubic yard; curb stone dressed, 90 cents per linear foot; rough curb stone, 18 cents per linear foot; stones for crossings, 45 cents per linear foot; rubble stone, $6.00 per cord; rubble footings, 30 cents per cubic foot; dressed headers, 50 cents per linear foot.

In the last annual report of the city engineer of Winnipeg, the quarry account showed a surplus of $24,716.59. This surplus was distributed to the sinking fund in the sum of $10,535.03, and to the interest account, $5,161.51, leaving a net surplus after paying interest and sinking fund, of $9,021.05.

Much of the work on the city streets is done by the city engineer's department. The city has laid a great many yards of asphalt paving, including the foundation. The municipal asphalt plant has been operated for three seasons and has passed the experimental stage and become one of the permanent industries of the city. The plant is an old one, having been constructed some six years ago by the contractors for the first asphalt paving. Some improvements, suggested by City Engineer Ruttan in 1901, were estimated to effect a saving of at least ten cents a square yard in the cost of paving. For the first three years of its operation the maintenance, operation and capital charges amounted to $6,709 and the total number of square yards laid during that time aggregated 122,443. One of the accompanying illustrations shows the workmen of the city laying concrete foundation for asphalt by means of a Drake No. 2 portable concrete mixer owned by the city. According to the city engineer, from 1,000 to 1,200 square yards of four and one-half inch concrete can be laid by it with ease in nine hours with the aid of one engineer and ten men. Better concrete is secured by using the machine than by hand mixing and at a saving of fifteen per cent. in cement, thus giving a practical demonstration of the machine's efficiency.

AUTOMOBILE REGULATIONS IN EUROPE

At the time when the cities of the United States are forming the rules for the use of automobiles in their streets, it may be of assistance to give a brief digest of some of the regulations that obtain on the other side of the Atlantic. Before a person can operate an automobile through the streets of Vienna, Austria, he must have his machine inspected and approved by the authorities and obtain a certificate of approbation." This cannot be transferred if the ownership of the machine changes. Two strong brakes that work independently of each other must be provided, one to act directly on the driving wheels and one to be operated by the feet. Every bit of controlling apparatus must be so placed that it can be worked without the operator taking his eyes from the road. Special signals must be provided and two good lamps of sufficient intensity to throw light onto the road for twenty two yards in front must be used. Each machine must be able to turn in twenty feet. Each must show the name of the manufacturer and the official number of the system or type. The rate of speed must not exceed, in inclosed spaces, that of a horse at a good trot and in narrow streets, around curves and across bridges must be that of a pedestrian. The owner is responsible for the machine and driver's acts and the "certificate of approbation" must always be carried and shown the police on request. If accident occur through violations of the rules, the punishment is from one month to three years' imprisonment. If no accident, a fine of from $2 to $20 is imposed.

In Antwerp, Belgium, the speed regulations are the same as in Vienna, but in front and back of the machine must be carried lamps fitted with transparent glass, showing light on three sides and indicating in red or black letters the number of the machine. In this and other cities of Europe the machines must not be left standing on the streets unless so fixed that they cannot be moved.

In Brussels automobiles must carry metal plates on the front and back bearing the number of the machine taken from the special register for the whole of Belgium. At night a good light must be placed in front and one at the back must illuminate the number mentioned. A gong loud enough to be heard fifty-five yards must be carried, also, and brakes capable of wedging the wheels must be fitted to each machine. In the open country the speed must not exceed thirty-one miles an hour and in the city six miles an hour.

A Presidential decree has been issued for the whole of France permitting the cities to make such regulations as they see fit but also outlining certain general regulations. Though distinct systems of brakes must be provided, one to act directly on the wheel or hub and one to stop all backward movements. Each machine must display the name of the manufacturer, the type, the order number in the series of the type and the name and residence of the owner. A white and a green light are to be carried in front. In the open country a speed of 18.75 miles an hour can be reached, but in thickly settled sections 12.5 miles. In the streets of Havre a speed of 6.25 miles an hour is to be permitted and in the turning of streets, in parks and quays the speed of a horse walking is the limit. On each machine must be placed numbers of white paint on a dark background, 5.9 inches high and 1.8 inches wide and readable at a distance of fifty-four yards. The official number costs 29 cents and a "certificate of capacity" must also be obtained. Automobiles that enter the city must produce a "certificate of capacity" issued by the prefect of a province and will receive a number on paying 29 cents which will be refunded upon leaving the city.

Of the regulations for automobiles in Berlin, one provides that two brakes must be on every machine which will stop it within twenty-six feet. A bell must be carried and two lamps throwing light on the road for sixty-three feet. A bell must be rung at each crossing except where it would frighten horses. A license number must be displayed as well as the name of the owner, manufacturer, and weight and horse-power of the machine. The driver must be registered and the owner is responsible for all his acts.

In Frankfort, on the left sides of automobiles must be displayed clearly the name of the owner, his address or his firm name. In the country throughout Germany the speed is not to exceed 26.8 miles an hour. Imprisonment or a fine not exceeding $15 is the penalty for violations of the rules.

The usual number and certificate of inspection must be shown in Chemnitz, Saxony, and at night a light to illuminate the number as well as the road for a distance of fifty feet must be carried. A signal horn is to be used but it must be distinguishable from a locomotive whistle and that of the fire engine.

Permits are not issued to persons in Dresden under 18 years of age, but a fee of from $1.19 to $4.76 is charged for a permit to adults. The speed is not to exceed nine miles an hour and the right of way must be given to government wagons, funerals, royal carriages, troops, etc., and the machines must not turn around in front of mounted or driven animals. The extreme penalties for violations are $1 or 14 days' imprisonment.

For riding on the State roads in the Netherlands each machine must show black or white figures 4.7 inches long and 2.4 inches wide. At night the number in front must be illuminated by a light, and on either side a clear light must be carried to be seen from in front and side. A bell or horn to be heard 327 feet away must be used. In the open country the speed is limited to 12.4 miles an hour and in streets and crossing bridges 4.9 miles. In Rotterdam the speed is placed at between 3.1 and 7.4 miles per hour. In Amsterdam the chief of police must sign the permission certificate which is attached to the machine in a conspicuous place, and number plates must be displayed on the front and back. An extra lamp must illuminate the number at night.

STREET FORESTRY

Services Trees Perform for Cities Little Recognized—How to Select and Care for Street Trees—All Should Be Under Municipal Control

IT is unfortunate that the services of shade trees on city streets are not yet fully recognized. They are regarded more in the light of ornaments than as important factors in the health conditions of the city. To show some of the services rendered by the trees we have taken for the substance of this article the information contained in the report on "Street Forestry," by Mr. Frederick Shonnard, city forester of Yonkers, N. Y. Mr. Shonnard states the services as follows: First, trees afford needed protection from the sun; second, they break the force of cold winds; third, they rest the eyes; fourth, they impart coolness to the air, as the temperature of the air is never above 45 degrees Fahr., and the water transpired through the leaves in the form of vapor cools the air—a good sized oak will transpire 125 tons of water during a season; fifth, they absorb carbonic acid gas and give off oxygen. This latter service would indicate the use of the most trees in the most crowded quarters. Considering the great benefits to be derived from street trees, it it a pity that so little care is taken of them by the city authorities. Some cities have placed them under protection of the authorities and this is the only method by which intelligent care can be secured. An illustration of the lack of intelligence displayed by so-called expert foresters appears in the number of trees showing rotten trunks. Instead of being cut as close as possible to the trunk, limbs are lopped off at distances varying from an inch to a foot, and the wound left uncovered. The end rots, water collects in the opening and the rot works down into the trunk. A close cut and a little painting with water-proof material and the trouble would be prevented. Holes that have already started can be filled with cement or coal tar. In regard to trimming trees, Mr. Shonnard says that, while winter pruning is strengthening, trees may be lightly trimmed as soon as the growth has stopped and the leaves have turned.

In Yonkers as in most other cities heretofore each citizen planted whatever tree suited his convenience or fancy, with the result that there is often an entire absence of orderly and harmonious plan in the planting which would yield the greatest good to the greatest number, and would enhance the beauty of the property and the street. The great improvements in the ornamentation of cities with fine buildings should be accompanied with the beautifying of the streets with well-cared for trees. Mr. Shonnard remarks: "The repeated attempts to improve the appearance of a town by planting trees along the streets should be encouraged on every occasion." Unsatisfactory results from tree planting can usually be traced to three causes: Selection of unsuitable species; the mixing of several species on the same block; the crowding of trees. The last is the most important and common. Spreading avenue trees should be at least fifty feet apart and those on side streets not less than thirty.

HOW TO IMPROVE APPEARANCE OF STREETS

Mr Shonnard believes that: first, the local government should have control of the planting and care of trees; second, that trees should be of the same size when planted; third, that they should fork or head at the same height which should be at least twelve feet up; fourth, the whole street should be planted at the same time in equal conditions of good soil to secure an even growth; and fifth, one variety should be chosen for each street and the spacing should be adapted to the habit of growth and be made uniform. Citizens should have no more right to plant a poor or improper tree in front of their property than to lay inferior flagging. While city dwellers love the trees, they are not well informed as a rule concerning the relative merits of the varieties, or realize the bearing of shape, size, spacing, etc., upon the question of an artistic selection.

FINE EFFECT OF STREET WELL ARCHED WITH ELMS, BUT SPOILED BY CROWDING

The trees of Paris, France, are under the care of the city government, and are the finest of any city. Each tree is planted in a deep circular pit, in which good soil has been placed and over which iron gratings are set to allow air and water to percolate to the roots. The gratings form part of the walks. Washington, D. C., has the best tree system in America and both it and Paris have their nurseries where trees are carefully grown and shaped before being set on the streets. One of our illustrations shows a beautiful avenue of elms. A grave mistake was made even here, because the trees are too close together. They should have been planted so that a tree on one side of the street would stand opposite the middle of the space between the trees on the other side. This would

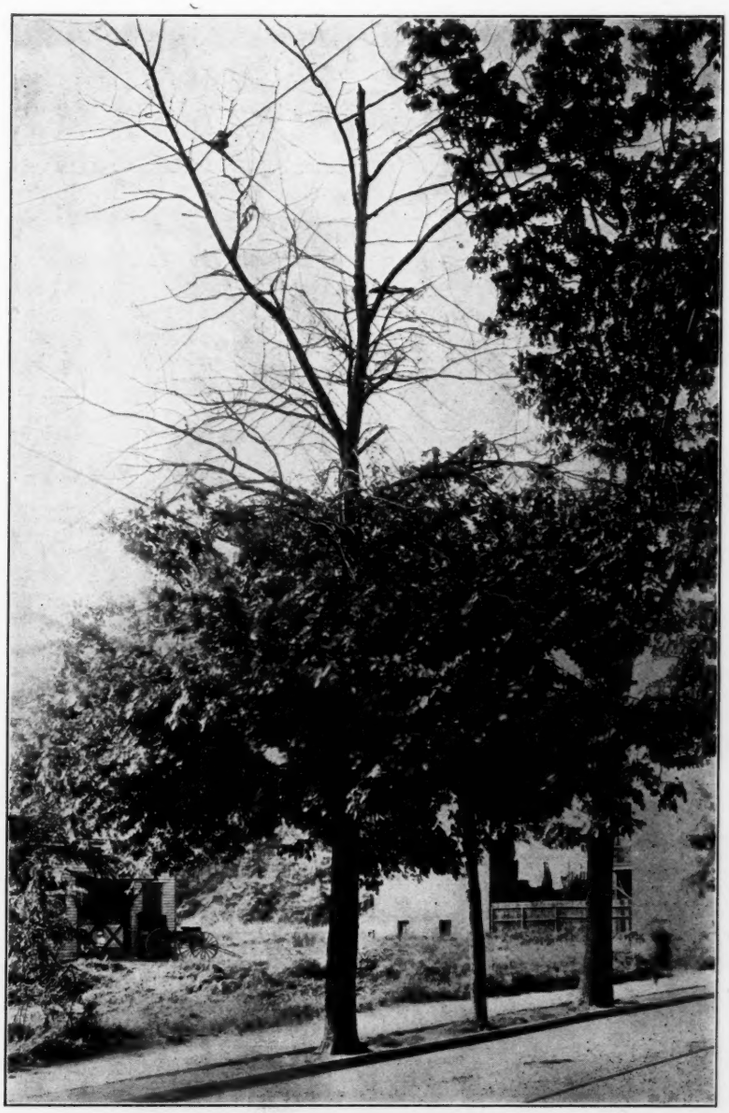
have permitted the proper space for the tree heads to develop and prevented distortion or mutilation. None of the trees shown is perfect in form.

The Selection of Street Trees

Many factors should govern the selection of a variety for any street. The width of the street limits the height of the variety. Streets on high ground and exposed to winds should have trees with tough branches and silver maple, popular, ailanthus and the like should be avoided. From the list of trees given in Mr. Shonnard's report showing the water conditions needed for them, it appears that the oaks can get along with considerable privation, although they do not make wood very fast. The horse-chestnut, ailanthus and Japanese jabonica need little water. In northern parts of the country the gingko tree does not produce the fruit that has been one of the objections to this kind of tree for street purposes, and so its many advantages fit it for northern city streets. The horse-chestnuts all grow in sugar load fashion, and are finely adapted for street use.

Care must be taken to secure good soil conditions for trees. Soil rich in humus or decomposed vegetable or animal substances, is what is needed. The best of this is naturally spongy, does not pack readily, and therefore admits air and water freely, and maintains the moisture in dry seasons. These last are most essential to a tree's prosperity. But there are many trees where the soil was not prepared before they were planted, and they are showing signs of slow death. While some may not be worth saving, proper care will save the larger number. Trees quickly respond to judicious cultivation. Mr. Shonnard does not believe that trees die of old age but from exhausted soil. Trees rooted under asphalt or other impervious pavements are liable to suffer more from lack of air than of moisture, inasmuch as the pavement prevents the evaporation of the water. Even on walks where there are no flags, the soil is packed so hard by tramping that air and water cannot penetrate. A good remedy for this is to remove about a foot of the soil and have the subsoil loosened and fertilized. Broken stone to the depth of ten inches should then be filled in and on top two inches of fine gravel. This gravel will never become so packed as to become impervious to water and air. One of our illustrations shows a typical case of a starving tree, while its neighbor is in good condition. This shows the great variety of soils in any one street. The tree was not poisened by gas because such show it in the abnormal coloring of the leaves and all parts of a gas-poisened tree are affected equally.

Each city department in charge of trees can gather together the dead branches and leaves of trees and form compost heaps. When decomposed this will form the best of fertilizer. Well-rotted stable manure could be placed in covered pits in the space between two trees. As a mulching material for the soil about young trees, wood sawdust is the most effective. When rotted it can be dug into the soil for a fertilizer.



OTHERWISE UNINJURED MAPLE, ROOTED UNDER ASPHALT, DYING FROM LACK OF NOURISHMENT

Transplanting Trees

In preparing trees for transplanting, it is best to cut back the roots annually. This produces a large number of rootlets with the greatest possible area of absorption which will cause a rapid formation of a ball of roots that enables the transplanted tree to quickly establish itself. In a tree that is transplanted the leaf surface must be reduced in proportion to the number of roots sacrificed in the work, but it is needless to cut back the branches if the roots do not indicate it. Such roots that have become bruised or broken in digging up should be cut off smoothly back to the good wood so that the roots will not decay and new ones will quickly form. Roots should not be exposed to wind or sun in transplanting, but should be covered with damp straw or bags or with damp mud. The fibrous roots must be kept from drying. The manure to be placed in the hole should be thoroughly incorporated with the earth to prevent it touching the roots which it would burn. It is a good plan to place poor earth about the roots so as not to overdose the tree with rich food. Water should not be used except to sprinkle the sides of the hole and the surface of the ground after the work is done. The less water the better. The soil should be rammed about the roots so as to bring them in close contact with it. Care should be taken, also, that water does not collect about the roots, as in such event the tree will die from lack of air. Loose stones should be placed about the tree to keep the ground moist and the surface of the ground about the tree should be loosened for a year or so to keep it from becoming dry and hard.

The Washington method of digging the holes for trees includes a hole seven feet long by three feet wide by three and one-half feet deep filled with the best available soil. The length along the curb causes the roots to run in that direction and so away from under the roadway. Good tree guards should be placed about all the trees to protect them from injury of horses, etc. Trees should be planted next to the property lines wherever possible so as to secure the best stretch of soil and to receive the greatest amount of water.

Street trees are subject to the attacks of many enemies, among which may be mentioned horses, insects, and illuminating gas. Careful watchfulness on the part of the authorities will enable them to combat the insects; good tree guards will protect the trees from

horses; but for the last only the authority of the officials to compel gas companies to maintain their pipe lines in good order will suffice. The street trees in all cities worthy the name of civilized and progressive, should be placed under the care of a separate department, the officials of which are selected for their experience and knowledge of aboriculture. Authority should be given these officers only to direct the planting, trimming and care of the trees and supervise all street openings, laying of walks, etc., of whatsoever kind, that will in any way interfere with the roots of trees. Only in this way can the trees of a city, important factors as they are in the health of the municipality, become an adornment to the streets and be kept in the best possible condition.

THE DRESDEN MUNICIPAL EXHIBITION

Ninety-Six Cities Represented—Lessons to Be Learned by American Municipalities—The Shortcomings of American Cities Pointed Out by an Expert

By Frederick Stymetz Lamb

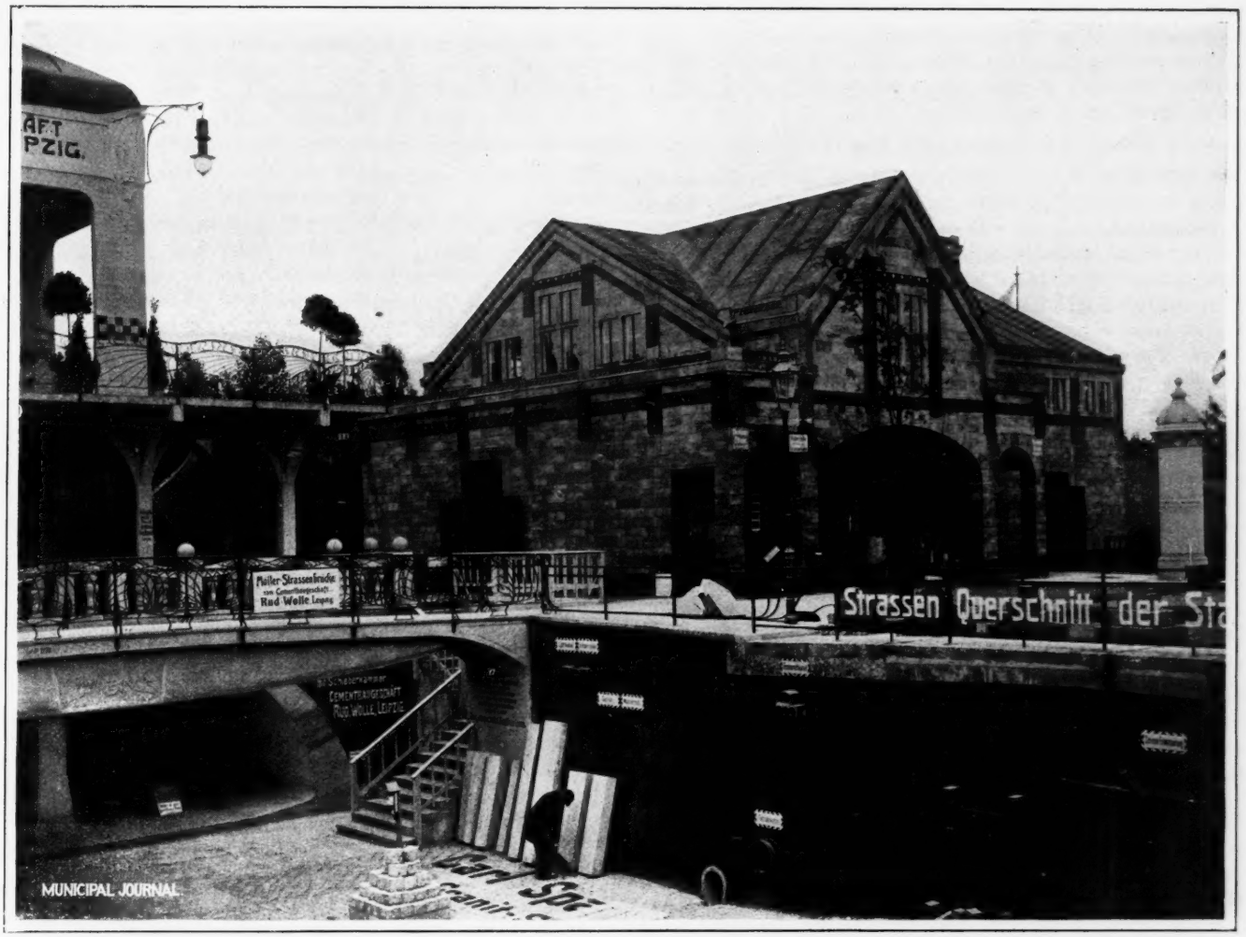
THE French Exposition of 1900, while apparently an unqualified success, was, in fact, the death knell of great expositions in Europe, as those of recent years have grown to such proportions as to defeat their object. In the exposition of 1900, the exhibits were so numerous as to make careful study an impossibility and the classifications were so multiplied as to force the expert to visit a dozen different sections in order to get the desired information. For instance, an American interested in electrical inventions must visit six sections to find the parts of one machine.

The idea, however, has not been altogether abandoned, as small, specialistic expositions have taken the place of the larger ones. These are more numerous and, at times, almost local in their interest, but nevertheless have a distinct purpose and are the means by which the government diffuses information and exerts an educating influence on the community selected. But few in the Uited States know that there is at the present time an exposition at Rheims; few have heard of the recent exposition at Leipsig, or Darmtadt, and hardly any are aware that Germany is about closing a most interesting exposition on on municipal improvements at Dresden.

While it was at first announced that Germany was to hold an international exposition on the improvements of cities, it was wisely determined later to confine it to the cities of Germany. The exposition thus became a specialistic one, illustrating what has been done in the German Empire in the way of city improvement since the time of the Franco-Prussian War; and, for this reason, is a thousand times more interesting to the student.

Comparison may be made between the work of the different cities and a comprehensive idea can be obtained of the astonishing progress

HAMBURG'S DISPLAY AT THE DRESDEN MUNICIPAL EXPOSITION



PLAN OF SURFACE AND UNDERGROUND STREET AT DRESDEN MUNICIPAL EXPOSITION

achieved in this short space of time. The fact that the cities of Germany are the only exhibitors, has spurred them to extra effort to make it a success; no less than ninety-six cities are represented. Even the smallest details have been considered and plans and working models are used to show the methods employed in every department of city work.

How the Exhibits Were Classified

In a rough way, it may be said that the exhibition is composed of two main divisions: One of plans, designs, statistics and published reports; the other, of models and sample exhibits of methods and materials used.

In the latter, we find everything from a sample brick to a working model of the method of supplying water to a city of the first class, such as Berlin, and the various methods of purification employed. The most complete information is given as to the construction of streets and road ways; each kind of paving is carefully illustrated by means of samples of materials and by a section of the finished work. Records of where these have been used are to be obtained, together with information as to their durability and expense. Granite or Belgian block, the wooden and composite block are used in almost equal quantities, the preference in each locality being based upon the convenience with which the material can be obtained. Asphalt is also a favorite, although not used as extensively as is often imagined.

The success and durability, however, of these roadways is due more to the foundation than to the material itself. In every case a deep bed of concrete is carefully laid before the final covering of blocks is placed, with the result that the roadbed, when completed, is a firm, slightly curved arch, which defies destruction. It is needless to say that the roadways are carefully watched and scrupulously repaired, so that one never sees the disgraceful condition often found in American cities. Care in the construction and careful supervision after construction, frees them from the criticism which can justly be made of the American system.

Methods of Paving Considered

In connection with the exhibit of the methods of paving, may be found several street sections of the actual size of existing streets and avenues showing the placing of electric conduits, pneumatic tubes, gas mains and the elaborate system of sewers and drainage pipes, by which disposition is made of the cities' waste. The most modern methods lead all drainage from both street and houses to one large sewer. This has a receptacle which retains the solid matter and allows the water to drain through. This receptacle can be removed and emptied as often as desired, thus conserving for the purpose of fertilization what, in American cities, is so wantonly thrown away. The water which passes from this receptacle is conducted to a lower and larger sewer and is carried to the outskirts of the city where it is allowed to flood some section of barren land, eventually preparing it for agricultural use. Thus, this sort of disposal of city waste not only safeguards the public health, but pays the expense of handling and returns a small profit to the community. Attention to this is even carried so far as to control the waste in sections outside of the city limits. No factory is allowed to discharge any of its drainage into the many waterways until it has been chemically cleansed and purified to the satisfaction of an inspection board.

In the interesting department of Parks much valuable information may be obtained. Not only are the methods of planning and planting shown in model, but even the smallest details are carefully shown by samples of the actual appliances used Thus, the tree-guards, instead of being as with us, mere iron grills, are provided with a hempen collar to prevent the abrasion of the bark. The system of repetitive planting is shown in detail and certain sections of the Exhibition laid out with paths, lawns and flower-beds, showing

how each park in each city is supplied with a flower garden, so carefully arranged as to be of use as a horticultural example to the neighboring schools. Even the method, by which statuary with its surrounding shrubbery is made such a telling adjunct to the park design, is carried out in detail.

How Art is Applied to Minor Details.

Street fixtures, in all the simplicity which distinguishes the foreign taste, are to be found in profusion; everything from the simple water hydrant to the most elaborate electrolier is to be studied, not only the actual fixture being used, but often so placed as to show its working possibilities and its relation to the street, or section, in which it is situated. The same is true of the many and varied ways of handling passenger traffic. Not content with one motor power, they have experimented with many, and while most of the systems are familiar to us, yet they have certain features which are worthy of note; as, for example, the overhead trolley, though extensively used, is so deftly installed as to be rather an addition, than a detriment, to the street in which it is placed. The cars are lighter and more convenient, the window spaces are more carefully considered and the transfer stations, in some instances, reach the dignity of minor public buildings. It is, of course, needless to say, that the German cities have the same difficulty in supplying the necessary transportation, that confronts us, but the intelligence with which the problem is met and the artistic quality of the appliances used, go far to relieve the situation from many of its complications.

The Completeness of the Exhibition

Even in lines which are well known and where similar methods are used the world over the exhibits are in no way slighted. As much care and attention are given to them as to the departments in which Germany excels many of the leading countries of the world.

A lecture hall of suitable size has been provided and from time to time illustrated lectures demonstrating points, impossible to explain by model, are given. No means seems to have been forgotten to make the Exposition as complete as possible. A special building has been set aside to show the advanced methods now used in cremation and to emphasize its importance in the sanitation of cities. Gas, water and electricity form another department. The fire department has its place; the latest development of the automobile and its various uses is also shown; the ambulance service, smoke consumers and heating appliances; even city work shops and repair stations have not been forgotten.

But interesting and instructive as these practical exhibits may be, they sink into insignificance when compared with the information to be found in the three great departments of Transportation, Expansion and the Care of Public Art. These are to be found in the main building and impart their information chiefly by means of plans and printed records. Under the head of transportation, we find a most careful record of the efforts that have been made in recent years to perfect German railways and minor lines of transportation. A careful study of the system employed must convince the unprejudiced observer that in this department at least, the German Empire excels the world.

How the Transportation Problem is Handled

The railroads being under State control, are so placed as to most advantageously and economically cover the entire field; no question of immediate profit is regarded; the development of the country, as a whole, is considered more important than immediate financial returns. The profit of one road has been used to develop another, so that Germany now has an unequalled system of radiating and interconnecting lines. Competitive rates are prohibited; each community receives equal advantages. Equally good judgment has been used in the development and control of the lesser lines of transit. In no city are the trolley lines permitted to parallel each other; they are so placed as to give the greatest distributing power with the least inconvenience. The system of radiating roads with circular connection at stated intervals, is used in all the important cities. The most notable result being, that absence of congestion which is the crying fault of the management of the transit lines in so many American cities. The corporate greed which, with us, has so shamefully disregarded the simplest necessities of our communities, is, with them, unknown. Every dollar invested is forced to return an equivalent in service rendered to the people, and, on the other hand, no sacrifice of the cities' convenience is made to unreasonable popular demand.

This intelligent handling of lines of transportation makes the question of the expansion of German cities easy of solution. Instead of waiting until a section is sufficiently settled to demand new lines of transportation, which, when built, must, from the very necessity of the case, be inadequate, roads are constructed in advance of the building up of these outlying sections, and so, readily control the situation. The success is not explained by the statement that these cities are of slow growth, for such is not the case. The recent progress made and the wonderful industrial development, has caused an increase in many of the important cities, little less than in our own. Due credit, therefore, must be given for the able way in which the problems, created by these new conditions, have been met.

The Shortcomings of American Cities

Much as the methods of transportation and expansion in American cities may suffer by comparison, our difficulties are as nothing compared to our shortcomings in what is termed by the Germans "The Corporate Care of Public Art." In fact, we would be at a loss to point out any department, which, in the most remote way, duplicates the elaborate work being done in German cities. Under this heading is included painting, sculpture, architecture and all forms of public construction. The plans of the city's simplest fixtures are carefully scrutinized. The designs of utilitarian buildings, such as transfer stations, railway terminals, postal, telegraph and telephone buildings, are prepared with the greatest care, while the important public buildings, such as schools, museums and city halls, receive a study and attention, which, to us, is incomprehensible. Sculpture, from the simplest panel to the most elaborate statue, is carefully considered and its importance, as a factor, not only in the enrichment of architecture but in the embellishment of the city as a whole, is fully realized. Utilitarian buildings have their bas reliefs and sculptured frieze; bridges are adorned with statuary and parks and public plazas are filled with portrait statues and historical groups. Painting is not forgotten; exterior color is used not only in marble, brick and terra cotta but in tile and mosaic. No public building is without important frescoes; every museum has its masterpieces, and no school is without some touch of color to relieve it from bald monotony. And this is all deftly controlled by the Department for the Care of Public Art. Exhibit after exhibit emphasizes the wonderful influence which art is having upon the development of German cities. There are models of the city halls of a dozen important cities and as many more of smaller ones. Museum upon museum and school after school are being built, and their design and construction are in keeping with the purpose for which it was created.

The Dresden Exposition must indeed be a source of satisfaction to all patriotic Germans. It shows a record of development which, taken as a whole, is unequalled by any other country in the period of time considered.

Why should not we, who are so quick to learn, take a lesson from their forethought and perseverance? Why should there not be in the United States an exposition for the benefit of city improvement, and why should not we, at no distant date, in all our cities, create Departments of Transportation, Expansion and Public Art?

STREET CONDITIONS IN LYNN

Bitulithic Pavement Giving Perfect Satisfaction—New Street Cleaning Method Saves Money—Sprinkling Done by Contract

THE condition of the streets of Lynn, Mass., has been the subject of considerable favorable comment in the press of that city, Street Commissioner C. A. Magill being complimented on the good work of his department. The branches of municipal service assigned to his division of the Board of Public Works consist of the following: The construction, repair and cleaning of streets, construction and repair of walks, repair and maintenance of bridges, care of shade trees, supervision of street watering, supervision of street excavations, investigation on the unauthorized occupation of streets.

During the last year a few of the streets were repaved, granite block, gravel, macadam, telford and bitulithic paving being used. North Common Street was paved with the last material in August and September, 1902, and, after a year's usage its condition was satisfactory as stated by Mr. Horace R. Parker, chief clerk of the Board of Public Works. In referring to its condition in July, 1903, he said: "Its present condition is perfect; there does not seem to be a blemish in its entire surface. It passed through the winter all right, and not one complaint was heard. Thus far the same is true of the summer, and we have no reason to expect any change. Today I have been over it carefully and should say its condition was even better than when it was first opened to travel." Commissioner Magill refers to it in his report as being a "pavement that has all the excellence of asphalt in being pleasing to the eye, smooth and noiseless to ride over and easily kept clean, but without the fault of being slippery. If the pavement wears well and withstands the winter frost and summer heat it will prove to be the pavement long sought."

BITULITHIC PAVEMENT ON NORTH COMMON STREET, LYNN, MASS.

The city has in service two crushing plants by which it prepares the stone for its street work. The rock that is excavated from sewer trenches and elsewhere is treated in these plants. It has cost $1.12 per cubic yard. One of the plants was furnished by the Union Road Machinery Company in 1893 and the other is a Gates No. 4. When properly handled these plants prove to be profitable undertakings for the city. The city has four road rollers at present, having purchased two recently from the Buffalo-Pitts Company, which shows that the Board of Public Works is satisfied with the wisdom of the investment.

There has been a radical change in the method of sweeping the streets by machinery. It was formerly the custom to sweep the whole of the paved streets on Saturday night only, if the weather permitted. Often it did not permit and the condition of the streets on Sunday was not of the best. The cost by this method averaged $101 for one sweeping of the area. The present plan is to sweep one-half the area with machines four hours every night, from 3 a. m. to 7 a. m., thus giving the entire surface a cleaning every other night. Then a gang of nine men and foreman with two carts pick up for four hours. The cost is $23.75 per night for this service. During the day there are seven push carts in commission. The men work eight hours a day for six days and four hours on Sunday. This cost $91 a week, which is increased by $22.75 a week for the team that picks up. The total cost of the present street cleaning is $263.75 per week, showing a considerable saving over the old way. The department uses a sweeping machine purchased from Abbott-Dowing & Co., in 1886, and two two-horse machines obtained from William Smith & Sons, of England, through W. C. Oastler, of New York.

The American Car Sprinkler Company, of Worcester, Mass., has a five-year contract for watering the streets. The company furnishes the necessary sprinkling carts, cars, horses and drivers, and takes care of thirty miles of streets. Commissioner Magill has supervision of the sprinkling and directs how often to do the work.

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Resignation of Chief Engineer Hill

WE have not commented heretofore upon the resignation of Chief Engineer William R. Hill, of the Aqueduct Commission, New York, because it was not definitely known that it would be accepted. Its acceptance has been deferred, hoping against hope, that Mr. Hill's health would so far be restored by a prolonged rest that he would feel warranted in withdrawing his resignation, but it has finally become apparent that the only wise course to pursue, if he would retain even his present degree of health, was to insist upon the acceptance of his resignation. His many friends will regret the condition that makes this step imperative, and, at the same time, hope that a complete release from all responsibility will bring about such improvement as to permit of his early resumption of the profession to which he has been such a credit.

In referring to the onerous duties of Chief Engineer Hill, Comptroller Grout, in a recent public statement, said in part:

"Shortly after the beginning of Mr. Hill's term he recommended certain changes in the plans of the New Croton Dam, which necessitated the taking down of a large part of the core wall and embankment at the south end of that portion of the dam already constructed and replacing it by a similar masonry structure. His grounds for this recommendation were the alleged general insecurity of this structure for the purposes intended, and evidenced, among other things, by certain small cracks, which he had observed in this core wall. The work was stopped on that portion of the dam, and a commission of expert engineers appointed by the Aqueduct Commissioners approved this recommendation after several months of investigation. This approval was also concurred in by Prof. W. H. Burr and Mr. Nelson P. Lewis, Chief Engineer of the Board of Estimate and Apportionment, who had been asked by the Mayor subsequently to examine the question and report thereon. The removal of this core wall was partially completed in March of this year, and revealed the fact that it was erected upon an insecure foundation, thus confirming the necessity of such removal. It was fortunate that Mr. Hill discovered this condition, otherwise a great catastrophe might have been precipitated upon the community hereafter.

"The records of the Aqueduct Commissioners will show the other recommendations of modifications, which have been made by Mr. Hill in these plans, as prepared by Mr. Fteley, for the construction of the New Croton Dam and the Jerome Park Reservoir. It required both courage and engineering skill to make such recommendations in view of Mr. Fteley's great and well deserved reputation. These plans might naturally have been assumed to be faultless, and their literal execution by Mr. Hill would have been expected and readily acquiesced in."

Mr. Hill's resignation has finally been accepted, and his successor, Mr. J. Waldo Smith, appointed by the Aqueduct Commissioners, to take effect October 15th.

Proposed Enlargement of the League's Usefulness

IN our September issue we printed "A Suggestion for the League," made by the Hon. James M. Head, Mayor of Nashville, Tenn. Mr. Head sent a copy of the article not only to all the officers and members of the League, but to the mayors of the leading cities not included in the membership.

Although the changes suggested by Mr. Head were radical in the extreme, they have received, thus far, universal approval. The leading officers of the League and many city officials have written warm words of approval; for instance, the mayor of an important Indiana city writes:

"I sincerely believe that your ideas are right and should be carried out. I think that exhibitions of the kind suggested by you will have a tendency to bring larger representations from different cities to these central meetings, and will be a better means of education than all the books that can be written."

A Michigan mayor says: "I believe that great good can come to municipal officials by admitting to associate membership the class you have in mind."

A Southern mayor writes: "I thoroughly agree with you, and fully believe that, if the suggestions made are adopted, they will result in great good to the League."

A New England mayor writes: "I am heartily in accord with your idea to improve the League. At first sight, to increase the membership by admitting various representatives from manufacturers looks good, and I have no doubt it would increase the interest in the holding of conventions. Longer sessions are desirable. At Grand Rapids there were too many papers for the time we were in session, which gave too little time for the discussion and the introduction of new business. The location of the secretary's office in New York would be an indisputable advantage, and would assuredly bring to our organization a greater measure of success than could be secured through any other single agency."

As we have said before, the present membership of the League is too changeable to give the necessary stability which is vital to the usefulness of an organization of the kind. We think it would be wise also to extend the membership so as to include the ex-municipal officials. It is the man who has had experience in managing some municipal office whose ideas are valuable, not those of the man who comes into office for the first time. If the ex-officials are admitted to membership, it will make it possible to build up a large and permanent membership, for a large per cent. of ex-officials continue to have a strong interest in civic affairs long after their terms of office have expired.

We would suggest another change: that the work of the League be divided among permanent committees, sufficient in number to cover the entire field of civic work not now included in some of the other influential national civic organizations. There would be no need for having a committee on civic government from its theoretical satndpoint, as that phase of the question is adequately cared for by the National Municipal League; there would be little use to touch upon civic art and its kindred reforms, as these questions are well handled by the American Park and Outdoor Art Association. Leaving these subjects out of the general scheme, there would still remain a field large enough to employ the services of a dozen or more permanent committees, whose annual reports would constitute the programs for discussion at the yearly gatherings of the League. We can readily understand how these committees could be chosen so as to have a chairman and his associates within meeting distance of a common center, and thus insure several meetings of the com-

mittee for real work during the year. It is not at all impracticable to so scatter these committees over the country as to include the best talent from among the active and ex-city officials.

Secretary MacVicar has demonstrated his fitness for the place. He took the League when its affairs were in a discouraging tangle, straightened them out, and has placed it on a paying basis. There is no doubt, we believe, in the minds of all the members of the League, that he is the man to take hold of this enlargement plan, and work it out to a successful consummation. Located in New York, the League would have a prestige that it cannot gain by having its headquarters in any other city in the country. This is true, not only because New York is the metropolis, but because—as Mr. Head has well said—the secretary would be within easy access to more information of interest to American cities than can be found in all the other cities of the country combined. Here, he could cooperate with the various committees and assist them in their labors as he could not in any other city.

It would not be necessary to hold the annual meeting in New York in order to receive the full benefit of this enlargement plan; in fact, we think it would be wiser to fix upon some city more centrally located where all the annual meetings of the League should be held, and where there might be located an auditorium and exhibition hall of sufficient size to house the exhibits and accommodate the business sessions of the convention.

It does not require any stretch of the imagination to see such an auditorium and exhibition hall built at the League's own expense some time in the future. With the growing interest in civic affairs, it is easy to understand how such an exhibit, taken in connection with the annual meeting of the League and the work of the secretary, can perform wonders in the development of American municipalities. Happily for our future, more and more serious attention is being given to the civic problems, and the rapid growth of cities demands such attention. We believe that the League of American Municipalities is the best equipped national organization of its kind to-day to handle this question in its broadest bearings, and we also believe that, if it does not see the necessity for this enlargement of its field of usefulness, some other of the national civic organizations will take up the work and perform the service which should be performed by the League. It will require much self-sacrifice, wise planning, and a large amount of energy before the League can expect to meet with the fullest success, but we hope it will rise to the occasion and demonstrate its fitness for the trust thus far imposed in it.

America's Indebtedness to Frederick Law Olmsted

Fifty years ago, not an acre of land had ever been purchased in any American city to be devoted to public parks; to-day the public parks and equipments are valued at $500,000,000. It is impossible to give an accurate estimate of the value of the park systems of American cities to the masses, but to those who are familiar with municipal conditions throughout the United States, there is no doubt as to what one person is to receive the greatest credit for bringing about this enormous investment in breathing places for the people —Frederick Law Olmsted is the man.

Mr. Olmsted was born at Hartford, Ct., April 27, 1822, and died on August 31, 1903, at Waverly, Mass.

The Boston *Transcript* gives the following editorial tribute to Mr. Olmsted:

"It is impossible to estimate accurately the extent of the influence which Mr. Olmsted's work has had upon American out-door art. His disciples are increasing, and the broad principles which he followed have come to be generally adopted as the best. Where he has left his most substantial impress on landscape gardening is in the fact that he prevented, in the inevitable reaction from the copying of English landscapes, departures and experiments, which might have been made, resulting in a meaningless jumble of contradictory features. Precisely such an influence as Richardson exerted on American architecture was exerted by Mr. Olmsted in landscape architecture. He turned the current in the right direction, and the instant appreciation of the value, use and beauty of his work gave a directing force to landscape art to keep it in the right channel.

"It was not alone in directing American out-door art that Mr. Olmsted performed a service of benefit to the American people. At a time when his career as a landscape architect was broadening and full of brilliant promise, he gave it up to become the directing force of the Sanitary Commission, and brought order out of chaos, seeing the Hospital Corps reorganized, collecting supplies and seeing that they went to the soldiers for whom they were intended, and refusing compensation for his services from the heavily burdened country. His duty to the State performed, he went back, like Cincinnatus, to the plough, and continued to spread the gospel of beauty and use in park development. Remarkably beautiful personal characteristics united with a high artistic gift in making his influence felt. The debt which America owed to him is large, but his monuments are everywhere in this country, where art and beauty have been combined in landscape treatment."

Carter Harrison on Paving Materials

In his recent annual message, Mayor Harrison, of Chicago, discusses paving questions at considerable length. While he does not profess to be an engineer, nor to speak in a technical way, nevertheless his conclusions are more than of passing interest and value to city officials, because of his extensive experience and observation.

He is manifestly correct when he says: "Property owners should be educated to the knowledge and conviction that in the long run the best of paving material, in spite of its first cost, is the cheapest and most economical, and the daily press can render valuable aid to the municipality and the citizens in helping to diffuse this knowledge."

He maintains that cedar block pavements are not to be tolerated. This is a conclusion that was reached by most American cities ten or fifteen years ago.

In referring to the new kind of wood pavements, he remarks: "Creosoted block paving, judging from the moderate experiments made with it locally, notably in Michigan avenue in front of the Auditorium and on one side of the Rush street bridge, shows splendid wearing qualities, is cleaner than asphalt because the dirt crusts rather than forms into dust, is far preferable from the standpoint of noisiness and because less dusty is unquestionably less open to hygienic criticism."

When he says, "for heavy traffic, as well as for the paving of street railroads' right of way, the only satisfactory paving material is dressed granite block," he shows his limited experience. There is no block stone pavement equal to Medina stone, which is rapidly being substituted for all granite stone pavements in many of the Eastern cities, and not a few of those in the Middle West. Brick would be preferable to granite blocks to lay between street railway tracks, but the Medina stone is better than any other paving material for this purpose, and for use on the heavy grades where some of the smoother pavements cannot be used. A granite block will wear smooth and turtle-back in shape, while the Medina stone never wears smooth, and always wears even. The only reason that Medina stone has not been more widely used in American cities is because its sale has not been vigorously pushed. It has been in use in Rochester, N. Y., for fifty years, and many other Eastern cities for nearly an equal length of time.

Acetylene Gas for Street Lighting

It is more economical to light small towns with acetylene gas than with electricity, or the ordinary manufactured gas. Natural gas, of course, shuts out all competition, as the cost of manufacturing is eliminated. There are over 10,000 towns in the United States, of 5,000 population and under, many of which are maintaining expensive electric light systems for street illumination. These towns could put in an acetylene gas plant at much less cost than an electric light system could be installed for and the streets more economically and more thoroughly lighted.

The arc light of twelve hundred or two thusand nominal candle power is widely used for street illumination, and it has only been within the last two or three years that better methods have come into use. Chicago was one of the first cities to depart from the old system of distributing its light. City Electrician Ellicott experi-

mented until he obtained the most desirable results. He found that by the use of a sixty candle power lamp, located on alternate sides of the street, one hundred and twenty-five feet apart, taken in the aggregate for a given street, would actually yield a greater total candle power at less cost than by using the arc lamp of greater candle power; moreover, he found that the street and sidewalk were much better illuminated. As a result, the smaller candle power lamps were substituted for many of the large arc lamps. Other cities have experimented along similar lines and obtained as satisfactory results, so that it is generally recognized now that residential streets lined with shade trees are more economically and thoroughly lighted by the use of the small lamps.

In this connection, it will be well for city officials everywhere to investigate the acetylene gas question, as acetylene gas lighting could be easily adapted to the suburbs of large cities and profitably used for the lighting of small towns.

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Special Subscription Offer

BY courtesy of the publishers—The Macmillan Company—we are enabled to offer, as a premium, the book, "Municipal Public Works," by S. Whinery, Mem. of Am. Soc., C. E., just published; that is to say, upon the receipt of $3.00, we will send the MUNICIPAL JOURNAL AND ENGINEER for one year to any address in the United States, Canada or Mexico, and one copy of Mr. Whinery's valuable work, postage prepaid.

The publishers have reprinted, at our request, one of the most valuable chapters in the book—"Guaranteeing Public Work"—which will be sent to any address upon receipt of a two-cent stamp. This reprint also contains the table of contents, giving the subjects of the fifteen chapters. The New York *Evening Post* says of the book: "It deals admirably, within its brief compass, with municipal problems of the day. There is much sound sense in the book." Any of our readers can take advantage of this offer by paying one year's subscription in advance. When it is remembered that the year's subscription to the MUNICIPAL JOURNAL AND ENGINEER includes more than six hundred pages of reading matter—not to mention the six hundred pages of advertisements, which contain information of much value to the thoughtful and progressive city official—and that any one of the twelve numbers is worth the price of a year's subscription, as many of our readers say, the liberality of this offer will be more fully appreciated.

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The Fate of a Bribe Taker

THE Asphalt Trust is largely responsible for another horrible example of official infidelity. Five years ago, the Editor happened to be in Scranton, when a ten-year contract for the repair of certain asphalt pavements in that city had just been awarded to one of the trust companies. It was common talk on the street that the contract had been the result of bribery, but no one, outside of a very small circle, even suspected the mayor of complicity in the deal. The facts in the case were not revealed until the administration succeeding that of Mayor Bailey, when, upon the stand, he admitted the taking of $1,000 bribe for signing the contract, which he knew had been illegally gotten by the official corrupting Trust.

Although a confessed bribe taker, his former popularity, and pity for his apparent weakness, served to ward off criminal prosecution, but a worse fate was in store for him. He took to drink to drown his trouble, and soon lost self-respect, position and wealth, and to-day he wanders with pauper imbeciles in the County Building that overlooks the place of his birth!

Mayor Bailey—as it is alleged he testified upon the stand—received $1,000, as a bribe from the Barber Asphalt Company for signing an ordinance, but it cost him all that was worth having in the world. It is true that most bribe takers, and bribe givers, escape punishment in so far as the public knows, but, nevertheless, this will serve as a warning to all city officials, and, it is to be hoped, will sufficiently strengthen some to resist similar temptations. Decent city officials do not need any warning.

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Savannah in Grasp of Asphalt Trust

OUR readers continue to manifest a lively interest in the doings of the Asphalt Trust. While we cannot afford to give up sufficient space to show up all its crookedness, we feel that for the necessity of the public welfare we should call attention to the Trust's misdoings for the sake of reminding our readers that the Trust is still doing business at the old stand. For this reason, many will be interested in the following item taken from the Savannah (Georgia) *News:*

"Savannah appears to be in the grasp of the Asphalt Trust. The condition of the asphalt paved streets is worse now than it has ever been.

"The city has pleaded and has threatened without result. The asphalt company has failed to keep its contract with the Mayor and aldermen. The concrete on some of the streets is exposed from one side of the street to the other, and no steps have been takn to fill in the holes.

"Promise after promise has been made by the asphalt people, and promise after promise has been broken. Acting Mayor Dixon says that he can only write the company, and this he has done. He is endeavoring to devise some plan whereby he can force it to do the work immediately."

♠

Fines for Neglect to Restore Pavements

THE public service corporations of Kokomo, Ind., have been having things their own way long enough, thinks Mayor M. A. Brouse. The street car, telephone and other corporations have been regarding the ordinances relative to the preservation of the street pavements too lightly; for instance, when any of the corporations, for any reason, have seen fit to tear up the pavement for their own purposes, they have not considered it necessary to restore the pavement in perfect condition, although there are ordinances requiring it, and, as a consequence, Mayor Brouse has recently compelled several of the companies to pay fines for such neglect.

The corporations in many other American cities are just as lax in obeying the law in regard to the preservation of pavements, but, in many instancese, no such ordinances exist, and any one, or any corporation, can tear up the streets and restore them or not as they see fit. Too many pavements have been spoiled in this way, and it is not just to the taxpayers that they should be asked to pay this additional expense. City engineers and superintendents of streets should be careful to enforce the ordinances relative to the tearing up of pavements for any purpose, and, if there is no such ordinance, these officials should make it their first duty to secure the passage of such an ordinance.

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Water Meters Appreciated

AFTER a long "Rip Van Winkle sleep," the citizens of Pittsburg have awakened to the fact that the meter system affords them a golden opportunity to reduce their water taxes, and, as a result, meters are being installed all over the city at the rate of from twelve to fifteen a day. While the meter saves money for the consumer, the principal advantage to the city is found in the prevention of the waste of water. Under the "flat rate" system, an enormous quantity of water runs to waste in residences, hotels, barber-shops, laundries, etc. In many places the water is kept running continuously and unnecessarily.

In Hamilton, Ontario, meters were recently installed in some of the city hotels for test purposes, and startling discoveries were made as a consequence. "For instance," according to the Hamilton *Herald*, "it was found that in one hotel bar—and not one of the busiest either—the water used in a single month amounted to more than 360,000 gallons. A stream from a half-inch pipe was kept running all day and most of the night." Now that a meter is installed, the proprietor will stop the wastage, and the city will reap a large benefit.

Constant inspection of water services at unexpected intervals has a tendency to reduce water waste, but the best agency for this purpose is the water meter, as it keeps tab upon the wasteful consumer twenty-four hours in the day.

There are many other cities besides Pittsburg and Hamilton which appreciate the value of the water meter system. No city which has given it a trial has ever returned to the old fashioned method of selling water.

Personalities

—Superintendent of Water Works, L. J. Wagner, of Rome, Ga., has resigned to become chief engineer of the Gulf Compress Company.

—Mr. Henry Serig has been elected to succeed Mr. N. C. Hamilton, who resigned as president of the Board of Public Works of Wheeling, W. Va.

—Mayor Woodruff, of Peoria, Ill., has been endeavoring to have the obnoxious billboards banished from his city and, with the aid of the police department, this will be done as fast as possible.

—The Council of Baltimore has unanimously confirmed the following appointments of Mayor McLane: Mr. W. Cabell Bruce to be city solicitor, Mr. Benjamin T. Fendall to be city engineer, and Mr. William H. Brune to be judge of the Appeal Court.

—Mayor Jeffrey, of Columbus, O., is in favor of taxing farmers who are in regular competition with business men by coming into the city with their goods and selling them on the streets. Business men have to pay taxes while the farmers contribute nothing to the city and a vehicle ordinance could be so framed as to make the farmer help pay for street repairs.

—Mayor John F. Laedlein, of Williamsport, Pa., vetoed a curfew law recently passed by the council. He finds many objections to the law, which was very strict, some of them being that the police officers would be greatly interfered with in their patrol duties, that the law is inconsistent in its provisions, that it is liable to cause much litigation because of its construction and that it is unnecessary.

—After a trip to Chicago and Cleveland, Mr. T. J. Moulin, superintendent of the Department of Public Works of New Orleans, returned to his city enthusiastic for clean streets. He expressed himself as heartily in sympathy with the work of the Progressive Union for the betterment of street conditions and says that keeping streets clean is the uppermost feature of municipal economy in the larger cities of the country.

—At a recent meeting of the Academy of Medicine held in Columbus, O., Superintendent of Water Works, Jerry O'Shaughnessy, Dr. C. O. Probst, secretary of the State Board of Health and others debated the question of the water supply of Columbus. A minority favored obtaining an increased supply first and leaving the question of purification until later, but the mapority urged the purification of the supply as the first consideration.

—Mayor A. F. Knotts, of Hammond, Ind., presents a new idea in economics. He wants the manufacturers of the city to employ only married men. He says the unmarried are the hardest to control in time of disturbances, and, when misfortunes come as the result of their agitations, they leave the city without loss to themselves. The Mayor says that the married man has more responsibility and so is apt to act with more conservatism. He has sent letters to all the manufacturers outlining his views which have met with considerable approval.

—Superintendent of Water Works, Frank L. Hines, of Salt Lake City, states that the people of his city waste more water every day than it would take, under ordinary circumstances, to supply a city twice the size. Citizens of a certain section had asked for more water for irrigation, but were refused aid by the Superintendent. If other people in the city were more careful of the water there would be enough for all to irrigate as much as was desired, but under present conditions only a limited amount could be alotted to each section of the city.

—City Engineer Ford, of Hartford, Conn., recently addressed the street commissioners on the proper position of street railway tracks on the streets. They should be placed in the center of streets instead of on the sides according to Mr. Ford. Streets with tracks on the sides have a one-sided development. Tracks on the side are hard to maintain and the width of the street is practically reduced by the space taken by the tracks and the companies usually keep the tracks so much above grade that they are dangerous. The roadway about the tracks should be kept in good condition; thus the street for the full width between curbs will be available for use and no part sacrificed for purposes of the railway.

—In discussing the great advantages of paved streets, City Engineer Dormant, of Houston, Tex., was led to speak of the brick vs. the asphalt pavement. The street paved with asphalt must have a certain grade or the water will remain on it and the asphalt will rot, with a slope of less than 1 per cent. the gutter will not keep itself clean and the asphalt will decay. Concrete or brick gutters should be used on slight grades. After asphalt streets are finished, too, the plant is often moved away and so repairs are often not made during the guarantee period. The advantages of brick pavements he gives as follows: "They maybe had in small units of uniform size and in any quantity; may be laid repidly without special expert labor; may be readily replaced if taken up for pipe laying, and they give a good foothold for horses and are adapted to all grades. Furthermore, they have low tractive resistance if the joints are grouted with cement; are not especially noisy if properly laid; are clean and easily kept so; are durable and easily repaired.

Convention Dates

OCTOBER

The next meeting of the League of American Municipalities will be held at Baltimore, Md., October 7th to 9th. John McVickar, secretary, Des Moines, Iowa.

The State Firemen's Association of Pennsylvania holds its annual convention at Allentown, Pa., October 6th to 10th. W. W. Wunder, secretary, Reading.

The next meeting of the League of Iowa Municipalities will be held at Waterloo, Ia., October 14th and 15th. Frank G. Pierce, secretary, Marshalltown, Ia.

The next annual meeting of the American Society of Municipal Improvements will be held at Indianapolis, Ind., the 20th to 22d of October. George W. Tillson, secretary, Municipal Building, Brooklyn, N. Y.

The thirty-first annual meeting of the American Public Health Association is to be held at Washington, D. C., October 26th to 30th. Dr. Charles O. Probst, secretary, Columbus, O.

AUGUST, 1904

The next session of the League of Georgia Municipalities will be held in Savannah the second Wednesday in August, 1904. Hon. Bailey, secretary-treasurer, Griffin, Ga.

Another Boom Launched

SECRETARY SCHUTZ, of the Milwaukee Health Department, is framing an ordinance creating a legal standard for the food used in boarding houses and hotels.

At last the boarding house brigade has found a candidate—
The man of destiny is here, we see the hand of fate.
No more the custard cup shall be a puzzle to our spoons;
No more the famished boarders shall be forced to feed on prunes;
And every boarder in the land arises and salutes,
And cheers the name and sound the fame of Secretary Schutz.

Here is a man at least who knows his country's pressing need,
Who knows the legions now compelled on doubtful stuff to feed,
Who knows the way the butter stands defiant on the plate,
And how the coffee is too weak its steam to radiate;
He knows the second handed pies and plaster paris fruits—
Each boarding place will boom the race of Secretary Schutz.

Hurrah! for now, at last, the man who boards shall get a steak
That is not adamantine stuff, too stiff to bend or break;
And all the secret, hidden things shall swiftly go to smash—
We'll know exactly what is put into the dish of hash.
Each boarder says this is the man who all requirements suits,
And makes a note that he will vote for Secretary Schutz.

The leather covered griddle cake must fly to other scenes,
For Secretary Schutz is apt to say just what he means.
So up from all the boarding houses now a cheer is wildly blent
A cheer that means that here's the man to run for President.
Star boarders and delinquents are prepared to bet their boots
That every voice will cheer the choice of Secretary Schutz.

—*N. Y. Tribune.*

A Home Made Asphalt Repair Plant

THE large prices demanded by the Asphalt Trust for keeping its pavements in repair after the guaranty has expired has caused many of the smaller cities to look about for some cheaper means of securing the performance of the same work. Some have bought small asphalt plants, similar to those made by City Engineer Hooke, of Chattanooga, Tenn., and others have constructed home made plants that would answer the purpose. The latest home made plant has

HEATING THE CRUSHED STONE

been put in operation by City Engineer Fred. Crandall, of Muncie, Ind., who gives the following description of his work:

"In trying to maintain an asphalt pavement upon which the maintenance or guaranty has expired, I have experimented somewhat with asphalt in order to lessen the expense.

"In the first place, I procured two halves of iron boilers, about fifteen feet long, and spread them to about six feet at the top. These I walled in (see accompanying illustrations) with brick on both sides and one end, placing a smokestack at the end of each and digging a trench under each for a fire pit through which I got a very good draft. In these tanks I placed my sand and broken stone—about one part of stone to four parts of sand—heating the mixture sufficiently. Then I poured over the sand and stone hot asphaltic cement, to which I added about five per cent. of oil, the latter being

PREPARING THE ASPHALT

well mixed before application, with iron paddles by two men. This is then taken in a cart covered with a tarpaulin upon the street, to be repaired and tamped as in asphalt pavement.

"I have also tried using old asphalt by heating the same over and adding a little fine, broken stone, which I found could be done to good advantage by using a little fresh asphalt.

"I met with some difficulties, such as burning and not getting the right proportions to my mixture, but in a few trials succeeded in making a very good and durable patch, so good, in fact, that we now repair our streets in this way, thus having the advantage of being prepared when a hole appears in our asphalt to repair it before it gets to be of any great size. In this way I hope to prolong the life of our streets until such time as resurfacing will be necessary. Considering this advantage and the economy of patching, our work is proving very satisfactory, although we have not had the test of a winter upon it."

The city of Winnipeg, Manitoba, has used a large plant for years to its advantage. City Engineer Hooke, of Chattanooga, Tenn., has used a smaller plant of his own make for several years and a similar small plant has been in use for some time in Wilkes-Barre, Pa. Other cities, also, have found it profitable to repair their own asphalt pavements.

Central States Water Works

THE seventh annual convention of the Central States Water Works Association, together with a meeting of the Boards of Public Service throughout the state of Ohio, was held in Dayton, O., on September 15, 16 and 17.

About 200 members of the association were in attendance from Ohio, Indiana, Illinois, Michigan and Pennsylvania, while the Boards of Public Service throughout the state of Ohio were also well represented.

The meeting in Dayton was of particular interest owing to the fact that when the recently enacted municipal code of Ohio went into effect, it threw out of office many water works officials who had been engaged for long periods. Under the new code the water works department falls as a sub-division under the Board of Public Service. These boards were desirous of discharging their duties properly, but many difficulties were encountered in the interpretation of the new code, and much good resulted from this general getting together.

The first meeting of the Boards of Public Service was opened Wednesday morning with the appointment of a committee to report on a permanent organization. After due consideration the committee recommended that the organization be made permanent. This recommendation was adopted and officers were elected as follows: President, John Stollberg, Toledo; vice-president, H. O. Pond, Columbus; treasurer, H. M. Andrews, Elyria.

The president appointed an executive committee consisting of H. O. Pond, of Columbus; George J. Vetter, of Youngstown; William Allison, of Cincinnati; H. E. Reiley, of Marietta; H. H. Soringboro, of Cleveland, and Louis Haas, of Dayton.

Following the election of officers a number of interesting papers were read, the most important of which was by Dr. Probst, of Columbus, secretary of the Ohio State Board of Health, on "The Pollution of Streams and Water Supplies in Ohio."

Mr. Jerry O'Shaughnessy, of Columbus, stated that there was a movement on foot in that city to expend $1,500,000 to properly care for the garbage and sewage of the city.

At the afternoon session the new code was taken up, and as a result many amendments to the code will be presented to the next Legislature.

A rule was also established at this meeting that the Ohio State Boards of Public Service shall be independent of the Central States Water Works Association, but they shall meet each year with the latter association and one day shall be given over to the boards of public service.

The officers for 1904 were elected as follows: President, Frank J. Kelly, Cincinnati, O.; first vice-president, T. R. Cook, Toledo, O.; state vice-presidents, E. M. Heeger, Indiana; W. H. Gore, Kentucky; J. E. Brady, Tennessee; A. L. Holmes, Michigan, and M. E. McKinney, West Virginia; secretary, William Allen Veach, Newark, O.; treasurer, Charles E. Rowe, Dayton, O.; executive committee, C. W. Wiles, Deleware; George F. Cooper, Xenia, and Jerry O'Shaughnessey, Columbus, O.; fianance committee, T. R. Cook, Toledo, O.; John Langan, Tipton, Ind., and A. W. Inman Massilon, O.

The next meeting will be held at Toledo, O.

Statistics of Arc Lighting in United States Cities and Towns

	Population, 1900.	No. lamps. Open.	No. lamps. Closed.	Watts at lamp terminals. Open.	Watts at lamp terminals. Closed.	Schedule.	Hours burn per year.	Cost coal per ton.	Contract price per lamp per year.
NEW YORK									
Addison	2,080	30	...	480	...	(3)	1,500	2.25	60.00
Albion	4,477	55	...	480	...	(4)	2,000	(7)	65.00
Amsterdam	20,929	169	85	340	550	(1)	4,000	2.75	75.00
Avon	1,601	26	10	340	430	(2)(3)	1,220	2.25	55.00
Binghamton	39,467	520	125	480	...	(1)	4,000	2.50	98.50
Brockport	3,398	40	...	340	...	(3)(4)	1,550	2.75	65.00
Buffalo	352,387	2,685	...	480	...	(1)	4,000	2.00	100.00
Canajoharie	2,101	...	50	...	430	(2)(4)	1,800	2.65	66.66
Canandaigua	6,151	92	...	480	...	(4)	2,200	2.85	80.00
Canastota	3,030	42	5	480	430	(2)	1,800	2.75	72.00
Canton	2,757	36	...	340	...	(2)(3)	1,220	...	55.00
Catskill	5,484	70	...	340	...	(2)(4)	1,550	3.30	55.55
Clayton	1,913	20	...	480	...	(3)	1,825	3.50	50.00
Cohoes	23,910	153	...	480	...	(1)	4,000	W. P.	75.00
Cooperstown	2,368	43	...	340	...	(1)	4,000	...	75.00
Corning	11,061	...	85	...	480	(1)	4,000	2.25	80.00
Dunkirk	11,616	90	...	340	...	(2)	2,179	2.10	z
Ellenville	2,879	...	55	...	430	(1)	4,000	W. P.	54.24
Elmira	35,672	355	...	340	...	(1)	4,000	2.25	80.30
Flushing	.....	...	1,975	...	430	(1)	4,000	3.00	113.00
Fonda	1,145	34	...	340	...	(4)	2,190	(7)	60.00
Ft. Plain	2,444	...	40	...	430	(1)	4,000	W. P.	60.00
Fredonia	4,127	78	...	480	...	(4)	2,190	2.30	26.28
Fulton	5,281	80	...	480	...	(3)	2,007	2.50	72.00
Geneseo	2,400	46	...	480	...	(3)	1,385	2.60	65.00
Geneva	10,433	100	...	480	...	.....	3,500	2.57	80.00
Glens Falls	12,613	111	185	...	480	(1)	4,000	3.30	78.00
Gloversville	18,349	131	...	340	...	(1)	4,015	3.70	92.60
Goshen	2,826	...	8	...	550	(2)	2,179	3.00	96.00
Gowanda	2,143	23	5	340	...	(1)	4,000	2.25	48.00
Greenwich	1,869	65	...	480	...	.....	2,179	W. P.	57.50
Groton	1,344	...	36	...	550	(3)	1,379	2.90	z
Hamilton	1,627	54	...	340	...	(1)(2)	2,179	3.45	37.00
Hempstead	3,582	75	...	210	...	(1)	3,650	5.25	84.00
Herkimer	5,555	75	...	480	...	(1)	3,412	2.65	80.84
Hornellsville	11,918	93	...	480	...	(1)	4,400	2.25	90.00
Hudson	9,528	...	110	...	430	(1)	4,000	3.85	108.00
Ilion	5,138	...	75	...	430	(1)	4,000	2.70	z
Ithaca	13,136	99	58	480	...	(1)	3,650	3.00	109.50
Jamestown	22,892	298	...	340	...	(1)	3,590	2.00	36.36
Jordan	1,118	31	...	340	...	.....	3,000	W. P.	50.00
Keeseville	2,110	31	...	480	...	(2)	2,179	W. P.	48.40
Kingston	24,535	75	48	...	430	(1)	3,960	3.06	85.00
Little Valley	1,085	17	...	480	...	(2)(3)	1,220	2.45	70.00
Lockport	16,581	256	...	480	...	(1)	4,000	2.35	78.00
Lyons	4,300	73	...	340	...	(1)	4,000	2.55	80.00
Malone	5,935	...	72	...	430	(1)	4,000	W. P.	50.00
Manlius	1,219	21	...	340	...	(2)(3)	1,220	W. P.	62.50
Marathon	1,092	26	...	480	...	(2)	2,179	W. P.	59.00
Mexico	1,249	...	23	...	430	(2)	2,179	(7)	50.00
Middletown	14,522	61	4	340	480	(1)	4,000	2.70	71.60
Mt. Morris	2,410	46	...	340	...	(4)	2,190	2.25	57.00
Newark	4,578	...	68	...	430	(1)	4,000	2.25	55.00
N. Tonawanda	9,069	298	...	...	...	(1)	4,000	W. P.	77.00
Nyack	4,275	...	79	...	430	(1)	4,000	3.20	115.00
Ogdensburg	12,633	35	100	480	430	(1)	4,000	3.42	72.09
Olean	9,462	68	25	480	...	(1)	4,000	2.00	85.00
Oneida	6,364	75	...	480	...	50(2)(4) 25-(1)	1,550 4,000	2.75	75.00 99.00
Oneonta	7,147	71	...	480	...	(1)	4,000	W. P.	109.50
Owego	5,037	77	...	340	...	(1)	4,000	2.65	69.43
Oxford	1,931	30	4	340	...	(2)(4)	1,550	3.00	50.00
Penn Yan	4,650	57	...	480	...	(1)	3,660	W. P.	68.00
Perry	2,763	50	...	340	...	(4)	1,567	2.30	52.00
Phoenix	1,532	28	...	340	...	(3)	2,007	W. P.	45.00
Plattsburg	8,434	60	...	480	...	.....	2,920	4.40	75.00
Port Jervis	9,385	121	...	480	...	(1)	4,000	1.25	74.77
Poughkeepsie	24,029	300	...	480	...	(1)	3,741	2.45	89.00
Rochester	162,608	2,593	200	480	...	(1)	4,000	2.50	146.00 91.25
Rome	15,343	185	...	480	...	(1)	4,000	2.75	83.95
Salamanca	4,251	45	...	480	...	(2)	1,900	2.25	72.00
Sandy Hill	4,473	90	...	480	...	(1)	4,000	W. P.	80.00
Saratoga Springs	12,409	117	...	480	...	(1)	4,000	4.00	96.00
Schenectady	31,682	...	266	...	430	(1)	3,650	3.10	92.71
Seneca Falls	6,519	...	77	...	430	(3)	2,007	W. P.	65.00
Springville	1,992	40	...	480	...	(1)	4,745	W. P.	z
Syracuse	108,374	1,172	...	480	...	(1)	3,570	2.00	85.77
Troy	60,657	410	...	480	...	(1)	4,000	2.80	129.50
Utica	65,383	...	700	...	480	(1)	3,650	2.65	124.10
Warsaw	3,048	40	...	480	...	(4)	1,550	2.55	74.50
Waterloo	4,256	55	...	480	...	(3)	1,385	W. P.	60.00
Watertown	21,696	200	...	480	...	(1)	4,000	W. P.	73.00
Waterville	1,571	...	40	...	430	(4)	2,190	2.75	70.00
Watkins	2,943	44	...	480	...	(4)	2,190	2.65	60.00
Weedsport	1,525	40	...	340	...	(2)(4)	1,900	2.25	60.00
Wellsville	3,556	29	...	480	...	(1)	4,000	Gas	80.00
White Plains	7,899	29	...	340	...	(1)	3,987	...	100.00
Wolcott	1,279	18	...	340	...	(2)(3)	1,200	2.90	66.67
Yonkers	47,931	308	16	340	...	(1)	4,000	...	110.50
NORTH CAROLINA									
Asheville	14,694	97	...	480	...	(1)	4,000	W. P.	72.50
Durham	6,679	6	61	...	430	(1)	4,000	3.50	87.50
Elkin	860	...	7	...	550	(2)	2,179	W. P.	25.00
Henderson	3,746	25	...	430	...	(2)	2,179	3.60	100.00
Lexington	1,234	24	2	480	...	(2)(3)	1,220	3.35	50.00
Weldon	1,433	...	19	...	550	(2)	1,921	W. P.	80.00
Winston-Salem	13,650	...	180	...	430	(2)	2,179	3.50	75.00

(1) All night. (2) Moonlight. (3) Midnight. (4) After midnight up to 1 or 2 A. M. The difference in time may be judged from the column showing number of hours lamps burn. (7) Water power and steam. z Municipal plant.

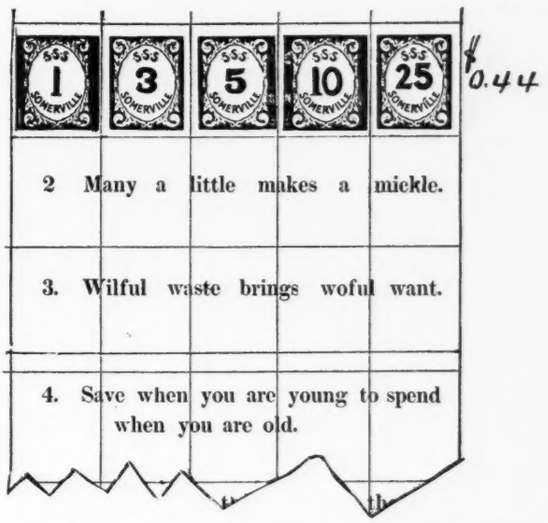
The data given in the above table were collected by the General Electric Company, Schenectady, N. Y.

(To be continued.)

Stamp Savings System for Schools

In the endeavor to encourage thrift among the school children of Somerville, Mass., the school authorities permitted the Associated Charities to put in operation through the school teachers a stamp savings system. Each week the principles are supplied with stamp cards at a cent each and with stamps in denominations of 25, 10, 5, 3, 1 cent each. The teachers sell these to the scholars after or before school hours whenever it is convenient and all the receipts are turned over to regular collectors by the principals. When a child has accumulated a dollar's worth of stamps on his stamp card he can become a regular depositor in the Somerville Savings Bank. Money in the bank or in the possession of the society will be returned to him whenever it is needed.

The teachers are expected to teach the value of money and on the cover of each book of stamps received each week are given some of


SSS 1 SOMERVILLE
SSS 3 SOMERVILLE
SSS 5 SOMERVILLE
SSS 10 SOMERVILLE
SSS 25 SOMERVILLE
$0.44
2 Many a little makes a mickle.
3. Wilful waste brings woful want.
4. Save when you are young to spend when you are old.

the values of money, such as the means of securing the necessities of life, of promoting comfort, of providing for education through school and travel, of enabling its possesser to help the needy and to make others happy. The children are to be shown the ways in which money may be wasted and how it will accumulate at interest.

As showing the interest the children took in the system, during the first twelve weeks they saved $7,378.39 on 1,000 bank books or cards, that were issued. As the laws of the state make it incumbent on all teachers to impart the principles of frugality among other virtues, a better system of doing this in a practical manner could not be devised. As the children are taught these virtues they will make better citizens and better city governments will be the result. The simplicity of the system is such that little extra work devolves upon the teachers.

Water Rates in Two Cities

Inasmuch as the city of East Orange, N. J., decided to install a waterworks system, it was necessary to establish the rates at which it could supply its citizens. These, with the penalties for violations of the rules, are as follows: One faucet, one family, $6.25; two families, $10; three families, $14; each additional family, $3; boiler, $1.25; bath tub, $5; two families, $8; closet, $2.50; for two families, $4; each additional closet, $1.25 each; additional tub, $2.75. In stables $2.50 a year will be charged for each horse, $1.50 for each cow and $2 for each carriage or other vehicle. Stores will be charged $10 a year for each faucet and bakeries $15 a year. By meter measurement the rate will be $2.25 per 1,000 cubic feet. Saloons, laundries, churches using water motors, greenhouses, baths and schools will be required to buy water at meter rates. The use of garden hose will cost $5 a season, and it can be used only between 7 and 8 o'clock in the morning and 5 and 8 at night. Rates are also fixed for the use of water by contractors in the construction of new buildings, and it is provided that specifications showing the amount of work to be done must be furnished before the water will be turned on. A fine of $50 is fixed for opening a hydrant, $10 for supplying water to any one not entitled thereto, $10 for turning

water on without a permit and $50 for violation of the regulations by plumbers or builders.

THE Council of Springfield, Ill., has been considering a revision of the water rates for that city, and thinks favorably of the following schedule: Meter rates to domestic consumers—3,000 to 5,000 gallons per month, 25 cents per thousand gallons, each additional 1,000 gallons up to 25,000, 20 cents.; minimum rate per month, 75 cents.

Commercial meter rate—For 15,000 gallons per month or less, 20 cents, and for every additional 1,000 gallons, 12½ cents; minimum price per month, $1.00.

Hotels and laundries—For 500,000 gallons or less per month, 10 cents; over 500,000 gallons, 8 cents.

Manufacturers—Per 1,000 gallons, 6 cents; minimum per month, $3; slaughter houses, brick yards and coal mines, 14 cents.

Railroads—Up to 500,000 gallons, 12½ cents; over 500,000 gallons and less than 1,000,000 gallons, 8 cents; from 1,000,000 to 2,000,000 gallons, 8 cents; from 2,000,000 to 4,000,000 gallons, 7 cents; from 4,000,000 to 5,000,000 gallons, 6½ cents; 5,000,000 gallons and over, 6 cents.

To Protect New York's Streams

AN addition to the laws of New York relative to the discharge of refuse matter or sewage into the waters of the State was passed by the last Legislature. It provides that no person, corporation or municipality shall have the right to discharge any sewage, garbage, offal, dead animal or other putrescible material of any kind, chemical or otherwise, in quantities dangerous to the public health, unless express permission has been granted by the state commissioner of public health. This provision, however, does not apply to the discharge of sewage or refuse matter in operation at the time of the passage of the act. Upon application to the state commissioner, permission may be granted to discharge sewage if, in his opinion, the public interests will be subserved thereby. The discharge of refuse from industrial establishments may be permitted by the state commissioner when the public health and purity of the waters warrant it, but the commissioner may prescribe such conditions and modifications as he may deem to be required by the public health. Any one constructing any outlet for waste matter without first obtaining a permit, shall be subject to a heavy fine. When it shall become necessary to conserve the public health, after a hearing, the commissioner shall have the power to revoke, or modify the permit granted. After a notice to discontinue the discharge of refuse or sewage, it must be stopped within at least two years in the case of a sewage system and one year in that of waste from industrial establishments. If the length of time is not specified in the permit, the time limits shall be one year for sewage and six months for industrial refuse.

All public authorities must file with the state board of health a report containing such facts about their sewage system as the commissioner may prescribe. Upon acceptance of these reports by the commissioner, they shall be filed as evidence of exemption under this act. Similar reports must be filed by proprietors of industrial establishments that are using waterways for discharge of refuse matter. Nothing in this law is to operate against the rights of riparian owners in the quality of the waters of streams covered by such rights.

New Voting Law for Johannesburg

IN reconstructing the government of the municipalities in South Africa, the Colonial Secretary addressed a request to the Council of Johannesburg for suggestions respecting an ordinance for municipal elections. An exhaustive report was presented to the Council by a special committee in whose hand was placed the request of the Colonial Secretary. In making the recommendations appearing later, the committee considered the conditions of their city as well as the customs in other parts of the world in so far as they were applicable to Johannesburg. The first point to be decided was whether the franchise was to be confined to taxpayers or whether it was to be extended to tenants of property not paying direct taxes. It was considered best that both classes should be included, as the committee considered that, although the taxpayer would be careful to see how his money was expended by the men he elected, many intelligent and educated people would be excluded on such narrow limitations of franchise. Representation should be based on education as well as property. The minimum value of property to be taken as entitling one to vote was placed at $500 for taxpayers and for those occupying property of the capital value of $1,500 or of the gross annual value of $120. The period of tenure of property was placed at three months. It was recommended that the franchise be confined to British subjects, following the practice in England and the United States, where citizenship is a requisite of the right to vote. The minimum age of voters was placed at twenty-one.

The question of extending the franchise to women was carefully considered, and it was concluded that men and women should be on the same plane in this respect, except that a husband and wife should not be permitted to vote in respect to the same piece of property. In all respects, each elector should be on equal footing with every other one. In the case of joint owners of property,2where the same does not exceed $500 in value for each owner, only one owner shall have the right to vote, and shall be named by the others in writing. If the capital value exceeds $1,500, all the owners shall have the voting power. This does not apply to stockholders or members of joint stock companies or associations. Every such association or company owning property valued at $500 shall be enabled to vote through their director or appointed officer.

Each elector must be qualified to read and write English or Dutch. No qualification was placed respecting residence, as the city is so much isolated that no danger is apparent of a large number of persons coming from a distance for the purpose of voting, and there are many, closely identified with the city, who are living just beyond the limits.

Those for whom the franchise was not recommended are those who should be in arrears in taxes, persons convicted of treason, murder, rape, theft, perjury or any infamous crime, unless having a free pardon or who have lived five years after serving their full sentence, persons disqualified by law because of corrupt or illegal practices at elections, certified lunatics, unrehabilitated insolvents.

The committee recommended as qualifications for candidates for office that only electors of the municipality be eligible, that no residential qualification be required, that the property qualification be the same as for an elector, that women be not eligible for council, and that the disqualifications that apply to electors be applicable to candidates.

Concerning the method of election, the committee decided strongly against the ward system and recommended elections of councillors on a general ticket. The objections to the former method were that a candidate must be acceptable to a certain ward as well as acceptable to the rest of the city. This would narrow the field of choice and exclude many good candidates for a vacant seat in council because they had no connection with a particular ward. The voter, too, is handicapped. If the candidates in his own ward are not fit for office in his opinion, while a neighboring ward has candidates either of whom he considers better than those in his own, he must vote for one he does not want or not at all. The ward system also provides the opportunity for gerrymandering. Members from wards are also in danger of overlooking the general needs of the city in their eagerness to champion the cause of their constituents and bargaining goes on between representatives of various wards.

The question of term of office for councillors was also taken up, and it was decided that three years was none too long. A short term kept good men from office inasmuch as they were not willing to undergo yearly campaigning, and by the time he had learned the methods of the council and had become acquainted with public questions, his term would have expired. A longer term would allow time to perform useful work. Therefore, the committee recommended that the council consist of thirty members, one-third to retire annually. Each voter should vote at any election for as many candidates as there are vacancies to be filled, but only once for any one man. The election should be by ballot and three elections should be held the

first year. Regarding the election of a mayor, the committee finally recommended that the English idea of this office be selected and that the mayor be elected by the council from among its members. He should be simply the chairman of the body and not have the power that is accorded to this officer in American cities.

How Bay City Builds Sidewalks

An ordinance has been passed by the council of Bay City, Mich, regarding the construction of stone, cement and brick walks the substance of which is as follows: The foundation for all walks shall be constructed by excavating to a depth of sixteen inches. The subgrade is to be well pounded. Nine inches of coarse gravel is then to be filled in and be well tamped while wet.

Concrete walks are to be made by filling in on top of the gravel seven inches of concrete composed of four parts of crushed stone, two parts of clean, coarse sand, and one part of Portland cement, the materials to be dry mixed until they attain an even color. Water is to be slowly added by sprinkling while the materials are stirred. The mixture is then to be placed in position and rammed until the water comes to the surface. One inch space must be left between the top of the concrete and the proposed grade for the cement top which is to consist of equal parts of clean, coarse sand and Portland cement mixed dry and then wet. The top must be leveled and then troweled. This surface must be wet three times a day for ten days and must be protected against the sun and air currents. The surface must be corrugated or uniformly indented.

For brick walks a foundation of four inches of concrete shall be laid on the gravel. The concrete is to consist of one part of freshly burned and finely ground hydraulic cement, two parts of clean, coarse, sharp sand and three parts of broken limestone. The cement must be equal to the best quality of Milwaukee cement. The sand and cement must be well mixed while dry and then wet, the stone afterwards being mixed in while wet. After the whole has been well and rapidly mixed, it shall be placed in position and rammed to the proper height. Only enough water shall be used and the concrete must be solid when the water comes to the surface. The concrete must have ten days for setting and end sections must be stepped back before another section is added. A cushion of one inch of clean, sharp sand shall then be spread over the concrete and on this shall be placed a coarse of sidewalk brick with finished top at right angles to the curb, the joints being broken at least two inches with brick on the next row. The joints must be broken at right angles to the top of brick. The brick shall not vary more than one-eighth inch. The brick shall be rammed or rolled, but plank must be placed between the brick and the rammer. Into the interstices between the bricks shall be poured a grout of either English or German Portland cement and coarse sand, equal parts.

Stone walks shall have the same foundation as that of the brick, making proper allowance for the thickness of the stone which must not be less than three inches. They shall not be less than three nor more than eight feet square. The joints must be close and filled with cement grout as in the case of brick walks.

The above specifications apply to certain districts in the city. In all other sections the brick and stone walks are to be laid on nine inches of crushed stone, gravel, sand or ashes or a combination of them. On this is to be placed from one-half to one inch of dry, fine sand and on this the brick or stone with the joints filled as previously specified. All walks must have a pitch of one-fourth of an inch to the foot toward the curb. Seventy per cent. of the cost of building walks shall be assessed against the property benefitted, and thirty per cent. shall be paid by the city.

San Antonio's New Charter

Several of the provisions of the new charter of San Antonio, Tex., will be of interest to other cities; a few of the points of importance are as follows:

The government of the city is to consist of the mayor, four aldermen at large and one alderman from each ward. The other elective officers are to be a city attorney, an assessor, collector, a treasurer, an auditor, and a judge of the corporation court, all of which officers are to be elected by the voters of the city. No alderman can be elected from any ward but that in which he resides, and if he removes from the ward in which he was elected his office is declared vacant. Elective officers are to take office on the first day of June after every election and to hold their office for two years. A two-thirds vote of the council is required to remove from office any elective officer of the city. No officer or employee of the city is to be directly or indirectly interested in any business or sale of which the city is a party; shall not purchase city warrants or claims against the city; shall not insure any person contracting with the city under penalty of removal from office. Any alderman who has an interest distinct from that of a citizen in any question to be voted upon must disclose the same and be excused from voting. All officers and employees, except elective officers, are to be appointed by the mayor and confirmed by the council; but the council may abolish and re-establish all offices created by that body.

The following salaries are to be paid to the various officers mentioned: Mayor, $3,600; auditor, $2,000; city attorney, $2,000; judge of corporation court, $1,200; treasurer, $1,200; assessor, $2,000; collector, $2,500; each alderman, $5 per meeting attended. As at present constituted, a quorum is to consist of eight aldermen, and no tax, franchise or money appropriation is to be passed except on the affirmative vote of eight aldermen.

The council shall have the power to provide for the construction by the city, or any person for it, of water, electric light and gas plants, or may buy any such plants now or hereafter erected. The council shall have the right to regulate and prescribe the rates, prices and terms at which water, gas and electricity shall be furnished the inhabitants. The city is also to have the power to build or purchase any of the public utilities of the city, including gas, water, electric light plants, subways, conduit systems, and such systems may be purchased or constructed by a payment in cash of 25 per cent. of the agreed price, but no expenditure for such purpose is to be made without an affirmative vote of the taxpayers.

The city shall have the power to require the abolition of grade crossings and to compel railway companies to pave and maintain the streets lying between the rails and the tracks, and eighteen inches outside of the tracks.

Franchises for the use of the streets may be granted by a vote of two-thirds of the council, but no franchise shall be granted for any but a strictly public purpose. No franchise or privilege granted by the city council is ever to be assigned or transferred by the original grantee without the consent of the council, and no consent shall ever be given in advance of the ordinance granting the franchise or extension. No consent is ever to be given to such transfers without specifying by name the proposed assignee. Any attempted violation of any of the provisions surrounding the granting of franchises shall result in a forfeiture of the franchise. No franchise is ever to be sold without the consent of the council. No franchise is to be granted for a longer term than twenty-five years, and no franchise shall remain in force beyond the regular expiration of the charter of the corporation which was granted by lapse of time.

The city council is to have the power to annually collect ad valorem taxes for general or special purposes not exceeding one dollar per hundred dollars valuation. The ad valorem taxes are to be levied on real and personal property, including stocks, bonds, notes, franchises and privileges having a situs in said city, although the owners thereof be non-residents. Bonds of the United States, of Texas and of the city of San Antonio are not to be taxed. A poll tax shall be annually levied, not to exceed $1.00, upon every male inhabitant between twenty-one and sixty years of age, who has resided twelve months in the city. A penalty of 2 per cent. shall be assessed upon all annual taxes not paid on the first day of June or within one month therefrom. Besides this, an additional penalty of 2 per cent. interest is to be paid upon all taxes for each additional month or fraction of such delinquency, but the aggregate penalties shall never exceed 10 per cent.

The city money is to be deposited in banks of the city, and such banks shall give security for the full amount of the deposit and pay an interest of not less than 3 per cent.

Street Sweeping in San Francisco

The streets of San Francisco, Cal., are cleaned by no less than eight different methods included in the one system, which is by contract. One hundred and twenty-two "block" men are stationed throughout the wholesale and retail districts, each man having certain blocks to keep clean. The dirt is placed in metal dirt boxes along the walk, whence it is removed by teams in the daylight. The price paid for this work is 99 cents per thousand square yards. Certain streets south of Market Street are swept at night by machines after they are first sprinkled. The dirt is taken from the gutters before seven in the morning. Thirty-five cents per 1,000 square yards is paid for this class. All other streets are cleaned by hand-labor gangs, which have to go over certain sections a fixed number of times each month. Dirt is swept into piles and must be removed within two hours. The cost per 1,000 square yards depends on the district and runs from 39 to 25 cents.

The prevailing winds often fill the gutters with dirt, while the rest of the pavement is clean, and so special crews of three sweepers, a team and driver, go over the streets from one to four times a month to clean the gutters only. These crews are paid by the day and can be used to remove obstructions or refuse. The crew costs 33¼ cents per hour per sweeper, 39¼ cents for the foreman, and 65 cents for the team and driver. On Sundays and certain holidays a crew of fourteen sweepers and a foreman clean gutters and walks from six to ten in the morning on such streets where the people congregate. They cost the same as special crews.

On rainy days a force of twenty-five men cleans the crosswalks and sidewalks on the business streets. They cost the same as special crews. No other sweeping is done on rainy days. During the windy season, a driver and team cover the section where waste papers accumulate and remove them. The cost is 50 cents per hour.

Bituminous rock and asphalt pavements become coated with a thin layer of mud that is very slippery in wet weather, and cannot be removed with brooms. To get rid of it, sprinkling carts are used to flush the streets, while a gang of sweepers follows and scrapes the pavement with rubber squeegees. The cost is $1 per hour for the carts, including the water.

This is the system devised by the Merchants' Association and works well when the contractors are kept up to their work by rejections or fines after inspection by the city inspectors. Unfortunately it is impossible to make the contractors do what they should according to the system, and much complaint has been made on the part of residents. The ideal system is to divide the city into small sections and assign a man with broom and hand patrol cart to each and hold him responsible for the condition of that section.

Narrow Roadways Advantageous

The advantages of narrow roadways on streets are well known to many city engineers, but the citizens are not so well advised. To speak of a narrow roadway is apt to cause people to exclaim against any narrowing of the street for they usually think of the roadway as being more than just the width between curbs. No sensible person would advocate any narrowing of the streets; they are often much too narrow. A contributor to the Minneapolis *Journal* discusses the subject of narrow roadways, giving the opinions of several city engineers.

Many persons are deterred from laying pavement, however much they may be desired, because of the large first cost. If this cost can be reduced by providing less roadway to be paved, much more pavement will be laid. The width of any roadway should be adapted to the traffic demands, the greater the traffic the wider the road and vice versa. The advantages of a narrow road are given by this writer as: First, lessened original cost; second, maintenance, a sprinkling cart being able to cover a twenty-four foot roadway with one passage, thus reducing the cost of sprinkling. The cost of sweeping and repairing the pavement are also reduced; third, healthfulness, the stretch of green grass on either side of the roadway being much more healthful than any pavement; fourth, advantages in lighting, as the street lamps may be placed away from the trees; fifth, the stretch of earth and grass affords better means for water to get at the roots of trees; sixth, the gas and water mains, etc., being under the grass plots, there is no necessity of tearing up the pavement with the well-known evil results; seventh, less surface for the collection of dirt and dust.

The only objections offered to narrow roadways are that a twenty-four foot roadway will not accommodate its traffic and that teams cannot turn around. The traffic of a street will determine the width of road, and it will be easy to widen at little cost if the traffic demands it at any future time. Any wagon that is too large to turn within twenty-four feet can go to the first street intersection.

The saving in cost by paving but twenty-four feet as against thirty amounts to $7,040 per mile if the cost of the pavement is $2 per square yard. Every foot that the pavement is narrowed saves $1,173 per mile, and each owner of a fifty foot lot the sum of $5.07. The amount that is spent on paving the extra width of street where it is not needed, to say nothing of the cost of maintenance, could be devoted to extending the paving and thus secure greater benefits to the city at large.

The answers claimed to have been received from city engineers of several cities were as follows: Rochester, N. Y., finds twenty-six feet ample for all but principal business streets; in Cleveland, O., the minimum is twenty-eight feet where it is necessary to turn around, but twenty-four feet is not considered too narrow for residential streets; Winnipeg, Man., considers twenty-four feet sufficient; in Detroit, Mich., the average for residential sections is twenty-six feet; Buffalo, N. Y., has most residential streets of twenty-eight feet; Toronto, Ont.; residential streets are nearly all twenty-four feet; in Toledo, O., the residential streets vary from twenty-two to twenty-six feet in width; in Columbus, O., some of the wide residential streets have been improved with twenty-six or twenty-four foot roadways.

Italy Has Municipal Bakeries

Italy is trying the experiment of the "municipalization of bread"—that is, its preparation and sale by the municipal authorities—to head off the greed of the bakers, who in frequent cases have formed unions for the purpose of keeping up the price. Catania, in Sicily, has municipal bakeries. These bakeries make a specialty of bread, and the experiment of starting them has turned out so well that the municipality is able to sell the staff of life at about two-thirds of the price it used to be sold for in the town, pay its bakers higher salaries for shorter hours than obtain in private establishments and still make quite a goodly profit.

Catania—which has a population of about 100,000—undertook its rather novel enterprise last October, being practically forced into doing so by the greediness of the local bakers. The price of bread in the town had been outrageously high for some time, and at last the people got so angry that the municipal council, headed by the Mayor, ordered that a reduction of 14 per cent. be made in the amount then charged. The bakers struck as one man, and then it was that the municipality opened somewhat hastily improvised bakeries of their own where bread was sold at the reduced price.

These shops were a success from the start, and the municipality lost no time in submitting a more ambitious scheme to the citizens, who approved it. New machinery was bought, the city's business was extended and the price of bread was made still lower. For a long time the private bakeries showed fight, but now most of them have gone to the wall. However, it is calculated that the municipal bake shops save the public about $1,000 a day. Meanwhile the profits on Catania's bread business for the last three months—particularly expensive ones, too—is estimated at about $1,400.

The bread now provided is made from unadulterated flour, which the private bakers used or not, according to their individual notions of the moral obligations they were under to the community which they supplied. All Italy is looking on this and a few similar experiments, one at Perugia and one at Forli, with much interest and the surmise that something of much social and economical importance may grow out of it.

NEWS AND PRACTICE AMONG THE CITIES

New England Water Works Meeting—American Street Railway Association—Regulations for Explosives—How Chicago Regulates Smoke Nuisance

Meeting of New England Waterworks Association

THE annual meeting of the New England Water Works Association was held at Montreal, Que., on September 9-10. In replying to Mayor Cochrane's words of welcome, President Charles W. Walker spoke of the great country that Canada is becoming. Superintendent George Janin of the Montreal Water works, read a paper on a "History and Description of the Montreal Water Works," and Assistant Superintendent, T. J. Lesage, contributed one on "Details and Appliances of the Montreal Water Works," illustrating his remarks with lantern slides. At the following session Mr. Frank L. Fuller, of Boston, read a paper on "Covering the Natick Reservoir with a Concrete Roof," and Superintendent of Water Works, W. H. Richards, of New London, Conn., read some "Notes on the Building of a Storage Reservoir." On the 10th, Mr. M. F. Collins, superintendent of water works of Lawrence, Mass., told of "The Filter Plant, Lawrence, Mass.," illustrated by the lantern. The Hon. John O. Hall, of Quincy, Mass., spoke of "The Reciprocal Obligation of the Management of the Water Supply and the Community," treating both sides of the question, but showing that water was no longer a free article. The committee on "Uniform Statistics," reported at this meeting and Mr. Leonard Metcalf read a paper on "A Glimpse of Porto Rico." Mr. Frederick Brooks, of Boston, argued about the "Folly of Reckoning by Gallons, Which Differ Widely in Canada and the United States, While Both Have Identical Litres and Cubic Meters."

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American Street Railway Association

AT Saratoga Springs, N. Y., September 1-4, was held the annual conventions of three associations devoted to street railways. The oldest association, that of the American Street Railway Association, celebrated its twenty-first year. The other associations which are outgrowths of the older concern are the Street Railway Accountants' Association of America, which was formed in 1897, and the American Railway Mechanical and Electrical Association which is not yet a year old. The headquarters was at the Grand Union where the exhibits were shown. Three sessions were held by each of the associations, many being held simultaneously. It was estimated that 500 was the number of delegates and guests of the associations. The officers for the coming year were selected as follows:

American Street Railway Association: President, W. Caryl Ely, Buffalo; first vice-president, Elwin C. Foster, New Orleans; second vice-president, John Grant, St. Louis; third vice-president, James F. Shaw, Boston; secretary and treasurer, T. C. Penington, Chicago.

Street Railway Accountants' Association: President, F. E. Smith, Chicago; first vice-president, F. R. Henry, St. Louis; second vice-president, C. O. Simpson, Birmingham; third vice-president, J. J. Magilton, Schenectady; secretary-treasurer, W. B. Brockway, Yonkers.

American Railway Mechanical and Electrical Association: President, E. W. Olds; first vice-president, Alfred Green; second vice-president, C. F. Baker; third vice-president, W. O. Mundy; secretary and treasurer, Walter Mower.

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St. Joseph Regulates Street Openings

AN ordinance regulating the excavations in the streets of St. Joseph, Mo., has been passed by the council of that city. It provides that no person or corporation, including those possessing franchises to lay tracks, set poles, etc., shall disturb the surface of the streets or make any excavation without a written permit from the board of public works. The applicant for a permit must agree to save the city harmless from all damages that may come from such excavation or by reason of any failure to replace the surface in good and secure condition. The pavement must be placed in as good a condition as before the disturbance and if the material removed is not suitable for use again, other material of approved character must be put in its place. All individuals or unincorporated associations must file a bond in the sum of $500. Any licensed plumber may file a bond of $2,000 with the city comptroller which shall be held as indemnity to cover all permits issued to the said plumber. No comptroller's certificate shalll be needed by said plumber but he must make application for a permit and pay for the same as other persons are required to do. In addition to the bond required, each person or corporation must deposit with the board of public works the sum of $25 before a permit will be issued. This sum shall reimburse the city for replacing the surface of the street in proper condition if the party opening the same shall neglect or refuse to do the work properly after being notified to that effect by the board of public works. The board of public works shall have the power to require a greater deposit if the nature of the work indicates it. Permits are to cost in addition the sum of $1 except for repairs to sewers, gas or water pipes. Permits must state the time at which the work is to commence so that an inspector may be on the ground to see that the work is properly done. Work not done under inspection is to be deemed defective work. A penalty of from $10 to $100 is the fine for violating any section of the ordinance. Property owners may secure free permits and without filing bonds to set out trees on the walks, putting in posts, etc.

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San Francisco to Spend $18,000,000

THE Board of Public Works of San Francisco, Cal., has proposed a bond issue of $18,135,000 to carry out improvements of different kinds. City Engineer Grunsky prepared the estimates of the work which is to cover twelve propositions, viz.: Sewer system, $7,250,000; repairing and improving accepted streets, $1,621,000; children's playgrounds, $741,000; extension of Golden Gate Park, $330,000; Telegraph Hill Park, $597,000; St. Mary's Square, $205,000; park in the Mission, $293,000; Twin Peaks Park, $159,000; county jail and addition to hall of justice, $697,000; public library, $1,647,000; city and county hospital, $1,000,000; new schools, etc., $3,595,000. The purchase of the land on Telegraph Hill and the establishment of Twin Peaks Park will preserve to the city its beautiful surroundings. The city at present maintains but one playground for children on leased ground, but two more could be established as proposed. About thirty schools are proposed. A vote will be taken in September and it is hoped that the people will authorize the bond issue. The bonds will probably run for forty years and the interest will amount to over $13,000,000.

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Porcelain Pipes for Waterworks

THE Meissen China Factory, in Saxony, is making water pipes for waterworks which, on account of the various advantages they have over iron and stone pipese, seem to be a promising article, although they are more expensive than the latter. These pipes are very thin anl glazed, and are embedded in iron pipes, the space between the two substances being filled up with cement. China being the best resisting pipe material that we know of, every guaranty is given for an unlimited life of the pipes; moreover, the absorbing of iron in the water, which is very frequent when iron pipes alone are used, is made altogether impossible. Furthermore, the iron pipes by having particles of iron absorbed by the water will corrode in the course of time, forming hydrated oxides of iron, which will stop up the tubes and finish by eating holes in the pipes. So far this drawback to iron water pipes has not been very frequently noticed, but it is very likely that we will hear more frequent complaints about them when time draws on and the pipes now in use become older. China pipes, with the average diameter of ordinary water pipes, will cost about $714 per mile; if produced in large quantities their price could probably be reduced a good deal.

Illinois Free Employment Bureaus Successful

The fourth year since the establishment of the Illinois free employment bureau has just passed and the report shows that the number of men and women that have been helped to obtain employment has been steadily increasing. The total number of males who have filed applications for positions during the four years amounted to 101,207, and of these 80,683 were provided with places; 53,247 females asked for positions and 49,876 received them. Only 12,044 of the 92,727 applications for male help were unfilled and 14,083 out of 63,959 applications for female help. During the past year 39,953 positions were secured for male and female workers, only 3,968 applications having remained unfilled. The positions secured were of all kinds, from office boys up to hotel clerks and from errand girls to housekeepers. The good work that is being done by these free employment offices is being recognized by employers, for they usually send to the free office for assistance, as the recommendation given there is worth much more than that obtained from a private concern.

Sewerage System for Columbia

The sewerage system for which the city of Columbia, S. C., has been waiting for many years has at last been turned over to the city by the commissioners under whose direction it has been constructed. As the members of the commission have received no compensation for their work, the city council voted them the thanks of the community for their work of love. The system is a sanitary one only and cost $162,569.81 including all surveys, etc. The engineers began to survey for the work in October, 1901, and the construction begun in March, 1902. The system consists of 28 miles of sewers on the main system, the sizes running from eight to twenty-four inch pipe. There are twenty-six miles of six-inch house connections. An ordinance has been passed providing for the better health and cleanliness of the city, the Superintendent of Streets being required to keep the streets free from all rubbish and garbage placed in proper receptacles by the residents and street cleanliness must take precedence over all of his duties.

Fighting the Mosquito

The fight against the mosquito pest is being taken up more and more by different localities and it is hoped that before long sufficient interest will have been aroused to accomplish the desired extermination of the insect. That it can be exterminated provided every one in a community takes enough interest in the work to carry out in a thorough manner the methods recommended by the entomologists, is an assured fact from the results that have been secured in such places where these measures have been taken. The most important thing is to secure the thorough drainage of all pools, large and small, where the water will stand after a rain. Rain barrels should be covered or have a film of oil kept constantly on the surface of the water. This will prevent such of the mosquito larvae as have been bred in the water form securing the air that is necessary for their life. All the puddles and low places in and about a place should be drained if large, and filled with earth if small, so that water will not rest there. Were these measures taken by all in a locality—and little effort is neded to secure the results sought—mosquito pests would be a thing of the past. A combined effort of all should be made so as to accomplish the work at the same time. In Honolulu, H. I., the Board of Health has become convinced that dengue, which is epidemic there now, is spread by mosquitoes and so will begin a campaign for their extermination such as the military authorities waged in Havana, Cuba, when they rid that city of mosquitoes and consequently yellow fever and malaria. The report of the scientific expedition sent to Vera Cruz, Mexico, states that the infectious diseases, such as yellow fever, malaria, etc., are spread by the mosquito, inasmuch as an inland town, where no mosquitoes exist, is free from these diseases, although cases of yellow fever are regularly sent there for treatment. Were it not for the mosquito, Vera Cruz, in the opinion of the members of the expedition, would be a more healthy city than many of those in the southern part of the United States.

Rules for Connecticut Barbers

The Connecticut State Board of Examiners for Barbers has drawn up some new regulations that, if properly enforced, will remove the dangers to which customers are subjected. All razors, shears or clippers must be sterilized by immersion of at least five minutes' duration in a 1 per cent. solution of tricresol. All towels must be clean and be boiled before being used a second time. After use on each customer, no cup or lather brush may be used until being washed in boiling water. The floor, walls and furniture of each shop must be kept clean. Cuspidors and waste paper bowls must be cleaned with boiling water every day and all loose hairs must be kept from the floor. Barbers must wash their hands before waiting on each customer and no barbers having veneral or contagious diseases may be employed. Finger bowls, powder puffs and sponges are prohibited and combs, brushes, dusters, etc., must be washed often in water of ammonia or solution of borax. All soap, perfume and other toilet articles must be of good quality. No shop shall be deemed sanitary if any part of the same be used as a living, cooking or sleeping apartment.

To Regulate Use of Explosives

The city of Trenton, N. J., has passed an ordinance that is to prevent the use of any highly explosive compounds, such as nitroglycerine or dynamite. Section 9 states that "nitro-glycerine or blasting oil, dynamite or other nitro-glycerine explosives, fulminate of silver, fulminate of mercury, or explosive gun cotton, shall not be manufactured, kept or stored within, or carried through the city limits" under penalty of a fine of $50 for each offence and $10 for each day's continuance of the offense. The ordinance also covers the manufacture, storage, and sale of inflammable materials, such as petroleum, naphtha, gasoline, benzine, and the like. No one is to be permitted to keep or sell any of the articles that shall emit an inflammable vapor at a temperature of less than 110 degrees Fahr. Quantities of less than a barrel, however, may be sold, but must be labeled in German and English, so that the nature of the contents cannot be mistaken. All gunpowder must be kept in magazines or in metal cans well protected from flame or heat, and no wagon carrying such material in the streets shall be permitted to stop except for loading or unloading. No fire-arms of any description or fire-works shall be discharged except on legal holidays. Calcium carbide shall not be stored in bulk of over 125 pounds, and at all times the material must be kept dry and properly labeled. The safety explosives are not covered apparently by this ordinance, and it is presumed that the city officials recognize that there is no need for classifying them among the dangerous explosives.

How Chicago Regulates Smoke Nuisance

The visit of John C. Shubart, chief smoke inspector of Chicago, to the city of Milwaukee, Wis., gave renewed energy to the advocates of the ordinance before council for the abating of the smoke nuisance. Mr. Shubart spoke of the law that has lately gone into effect in Chicago looking toward the purification of the atmosphere. Under the law there is a chief boiler inspector, a supervising engineer and a chief smoke inspector, who constitute a board to pass upon the subject. When a plant is to be erected, the proprietors are required to submit their plans to the board, and if approved the work can be carried out. The chief smoke inspector must go about the city and look for plants from which dense smoke is allowed to issue, or of which people in the neighborhood complain. The owners are summoned before the board and are told to make the necessary changes to prevent the evil, and are given what time is needed to accomplish the work. Those that refuse are proceeded against at once. A fine of $10 to $100 can be imposed by the courts. City Engineer C. J. Poetsch, of Milwaukee, is in favor of this way of regulating things. Fires that are properly stoked should not emit black smoke, which is but a waste of much energy. If the fresh coal is distributed around the edges of the fire or just inside the door, the volatile gases will be forced out and be consumed as they pass over the incandescent material. After this coal is well coked it can be spread over the fire and no smoke or loss of energy will take place.

FIRE PREVENTION IN HUNGARY

What Is Being Done to Prevent Spread of Fire—Organization of Hungarian Fire Service—Suggestions for Better Protection of Life and Property

By Jules de Bölcs *

It is to be regretted that the Kingdom of Hungary has not up to the present been provided with any general legislation upon fire prevention, upon the construction of buildings or upon questions of fire extinction, but the Home Secretary is now endeavoring, by means of "edicts," to do all that is necessary to prevent the outbreak and spread of fire.

For the purpose of securing this end the following regulations have been put in force for the whole country:—

Water Supply in Villages and Townships

In parishes where the quantity of water requisite for the extinction of the fire is not to be found in natural reservoirs the parish authorities are obliged to have at owing to local circumstances, tanks, reservoirs, or ponds have to be made, which must be cleaned at least once a year.

The sinking of wells must be considered as one of the obligatory conditions for obtaining authorization for all large building undertakings. These wells must be sunk in places where, in case of fire, they shall be easily accessible.

In case of fire nobody may refuse least one well with an abundant water supply, and to keep the same in good order. Larger parishes must be provided with similar wells distributed in conformity with the requirements.

Where it is possible to sink wells, to permit the water on his premises to be employed in putting out the fire.

Fire Appliances in Villages and Rural Townships

In all houses, barns, granaries, and places where forage and corn are stored, the requisite quantity of water, as well as the necessary apparatus for the extinction of fire, must constantly be in readiness.

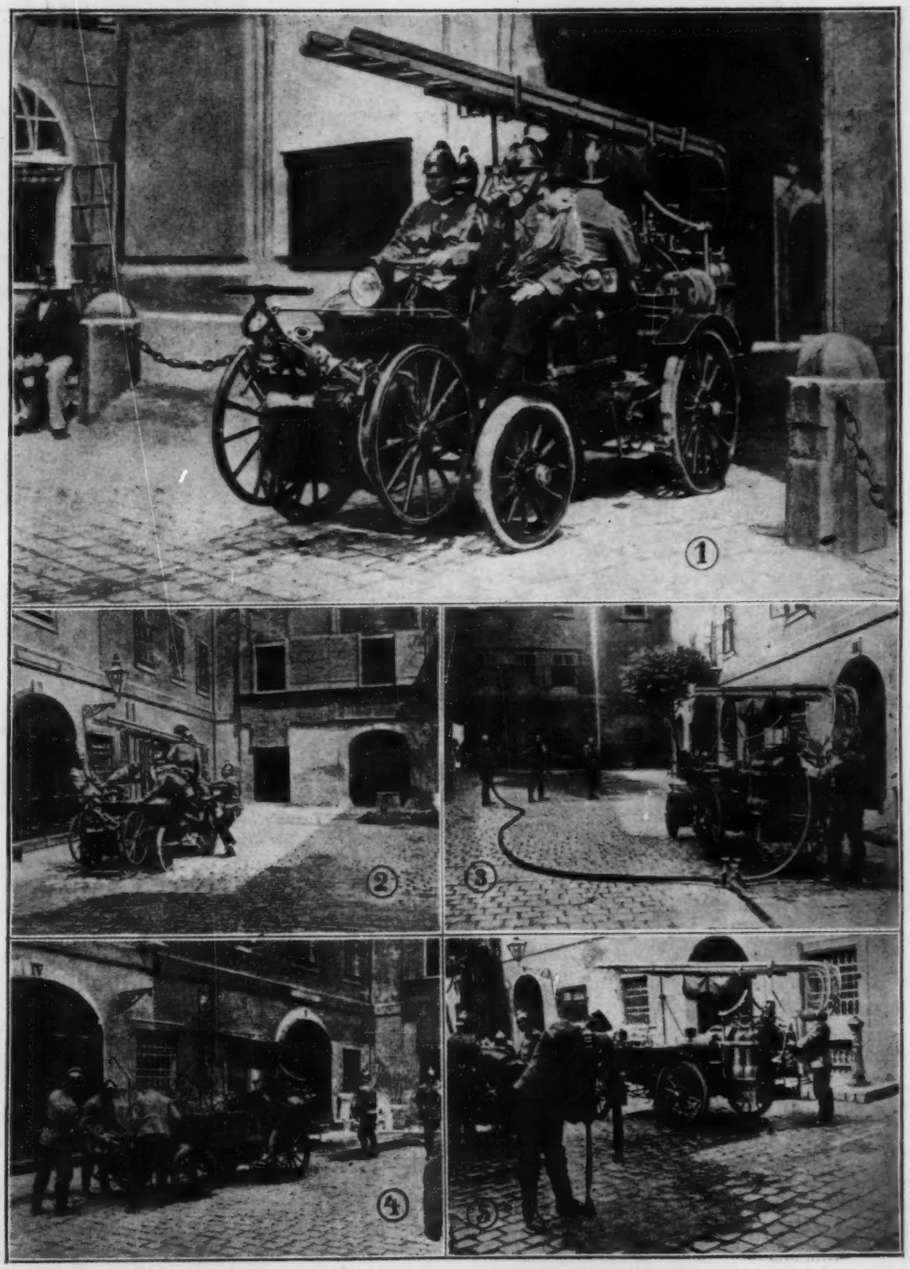
Each parish having more than 50 houses is obliged to provide the following implements, and to keep them in good order in a safe place, viz.—

(*a*) A suction-pump, or engine, with a cylinder of 100 mm. diameter, and a hose 60 m. long; (*b*) a water-cart with a cask of three hectolitres and a vat of one hectolitre; (*c*) two fire ladders; (*d*) two cramps; (*e*) two fire hooks; (*f*) two axes; (*g*) four iron forks; and (*h*) two lanterns.

The authorities in smaller parishes than those having 50 houses, as well as the proprietors of any individual large buildings, are obliged to keep at least one manual fire-engine or a tub squirt.

All ordinary houses must be duly provided with fire implements, the number of which is fixed by the local fire regulations, and at the inspection of the same it must be demonstrated that they are in good working order.

All suctions and all fire-hose, which the parishes are obliged to provide, must be fitted with the *standard* screw coupling in general use in the



Courtesy, *Automobile Topics*

SCENES IN THE LIFE OF VIENNA FIREMEN

* Departmental Councillor, Hungarian Home office, Budapest, who read this paper before the International Fire Frevention Congress held in London, Eng., July 6-11, 1903.

kingdom of Hungary. A representative of the local authority, accompanied by the chief of the local fire brigade, must inspect each post as frequently as circumstances demand, but never less than twice a year.

He orders, if necessary, the demolition of dangerous property at the expense of the respective owners, directs that the necessary fire apparatus be acquired by each proprietor, and ascertains by examination whether the necessary supply of water is obtainable in the desired spot and is ready for use.

Local authorities are obliged to observe the greatest care that the accumulation of forage and corn among dwelling-houses should be limited *as much as possible*. It is preferable that each parish should designate for this purpose, as far as may be feasible, a suitable place outside the boundaries, and that threshing of corn should also be carried on there.

The authorities are also to take very strict measures concerning the carrying of forage and corn into barns, threshing floors, stables, and granaries, and to see that near these places, and in general, wherever easily inflammable materials are heaped up, the carrying of free lights, shooting with fire-arms, lighting fires, the use of children's toys of a dangerous character, should be strictly prohibited, and that all inflammable materials be put out of the reach of children.

Tramps, who are often the authors of fires which develop into large conflagrations, must be strictly watched.

The inhabitants must be taught the advantage of being insured against fire, and they must be energetically encouraged to insure their goods.

The authorities must take care that the construction of houses is carried out in such a manner that fire preventive measures are observed, and the inhabitants should be encouraged, as much as possible, to use for building purposes solid materials, which are the least inflammable.

The Investigation of Fires

After every fire an investigation must be held on the spot, the aim of which shall be to ascertain the cause of the fire, and in the case of incendiarism, to order the legal punishment of the guilty persons.

As insurance companies in Hungary do not pay the sums due for fire damage until after the presentation of so-called "innocence" certificates delivered by the local authorities on behalf of the person who has suffered the damage, the parish authorities have—in order to prevent incendiarism—received strict instructions that in case of fire the direct cause of the fire, viz., incendiarism, negligence, carelessness, lightning, etc., shall be embodied in a formal report, whilst the investigation shall be held as early as possible, and carried on with energy; the certificates of "innocence" not to be delivered to the respective parties until the end of the investigation, if in conformity with the result of the same.

Chimneys must be swept at least once a month, and where the fire is kept up during the greater part of the day and often even during the night, the sweeping must take place more frequently.

The Value of Statistical Records

The authorities are obliged to send a report immediately after every important fire which takes place in their district to the Ministry of the Interior, besides which they are obliged to make, within thirty days of the end of each year, a return on a prescribed form of the fires which have taken place during that year, in order to furnish the necessary data to the statistical department. The data thus furnished are useful, not only for statistical purposes, but have also an administrative aim; for if the forms are filled in accurately they will furnish material to serve as a basis for drawing up fire-preventive regulations, which shall take into account the decrease of damage caused by fire.

These are, gentlemen, the principal regulations for preventing fires and limiting the spread of fire as practised in Hungary and put in force with the aid of Home Office edicts.

But, whilst I have much pleasure in recording the above fire-preventive and fire-protective measures, I cannot refrain from saying a few words upon the organization of the Hungarian fire service.

Fire Service Principles

With regard to the organization of the fire service in Hungary, there are to begin with, (*a*) paid firemen, (*b*) volunteer firemen, and (*c*) communal (*obligatory*) firemen, who are recruited in the different parishes from men of 20 to 40 years of age. The latter are enlisted where it is impossible to establish either a paid or a volunteer fire service.

The interests of the firemen in Hungary are protected by the "National Association of Firemen," which was founded in 1871. This association attaches a very great importance to the special knowledge of all that is connected with their work. To this end a special course of instruction is held annually in Budapest, which is the seat of the association, and those candidates who succeed in passing the course receive the first step of official rank from the association. In this manner, and by the special courses held both in fire-preventive and fire brigade measures, the association renders very useful service to the country.

I may also mention that candidates for the post of parish clerk, as well as the students of the Board School Teachers' Preparatory College, and those of the Agricultural College, are likewise participating in the special course for firemen. Moreover, it has recently been decided, that the army shall also attend the special course, under military supervision, and the ordinary firemen will have to put at the disposal of the army the necessary apparatus for teaching the

VIENNA FIREMEN DRILLING

extinction of fire, and will also co-operate with the soldiers during their special instruction. All these arrangements tend to improve both the fire-preventive and fire brigade measures.

Some Local Fire-Preventive Defects

Having now had the honor of giving an outline of some of the more important features of the work done in Hungary, in the domain of fire prevention and protection generally, I take the liberty of adding that, although the special dispositions named are very strictly observed, and although, thanks to the zealous co-operation of the different branches of the Firemen's Association, the general security from fire shows from year to year a great improvement, yet the country still suffers very much from the absence of uniform laws controlling the construction of houses; the building regulations, unfortunately, only being fixed by local by-laws. As a consequence of this state of things the construction of houses in the country still leaves very much to be desired.

For instance, to mention only one point, wood and straw are still used in many places for roofing purposes, and in some instances roofs thatched with reeds are to be found. The situation is, however, improving from one year to another, for the building regulations defined by recent local statutes generally expressly stipulate that within the parish boundaries incombustible materials must be used for roofing purposes.

In the towns, of course, the methods of construction answer modern requirements better than in the country; whilst in Budapest itself, the capital and royal residence, the conditions prevailing in respect to security from fire are such as few towns on the Continent can boast.

The laws upon fire prevention and the construction of public and

private houses which are now in preparation at the Ministry of the Interior, are aimed at remedying such evils as still exist.

Some Suggestions

Having thus given a general view of the measures and ordinances in force against fire in Hungary, I will, before concluding my paper, take the liberty of presenting a few suggestions.

My propositions aim, first of all, at the more efficacious protection of public life and property, and the limitation, as much as possible, of fires.

Following the lines of the opinions I have just expressed I would, in the first place, make the following proposition:—

Let the Congress declare that it considers desirable that each State should enact a modern law which shall comprise *all* branches of fire prevention and fire protection generally, and which shall be in its fundamental principles uniform; each State reserving to itself, according to its special circumstances, the arrangement of *details*. In other words, I am desirous of the Congress advocating a consolidation of existing fire preventive and fire fighting legislation, and adopting certain general principles common to all countries whilst leaving matters of detail to be settled locally.

I also take the liberty, in the second place, to recommend to the attention of the Congress the examination and future consideration of the following idea:—

Would it not be desirable that the Congress should declare that, in order to prevent or as far as possible to alleviate the distress caused by fire, the institution of obligatory insurance against fire is in its opinion salutary and necessary; and, without wishing in the least to commit the Congress to an expression of opinion upon the subject, I would remark as my own individual view that, to counter-balance the introduction of this institution, which would have, of course, to be brought about by the Legislature, the fire insurance companies should also be legally compelled, on the principle of reciprocity, to hand a certain percentage of their business revenue to the respective States, in order to meet the expense incurred by fire preventive measures.

The taxation under this head of the respective companies could not, if the material advantages accruing to them by the enactment of obligatory insurance are taken into consideration, in any way cause them expense which they would not be able to support; and, if we further take into account that, owing to the continual development of the fire service and its apparatus on the one hand, and on the other the enactment of adequate laws on fire prevention and building construction, the number of fires will decrease, and also as a consequence the risks of the fire insurance companies, then their taxation under this head undoubtedly finds complete justification.

In the third place, let me be allowed to submit to the Congress the proposition that, considering the great interests affected by security from fire, and the great importance of the fire service, would it not be advisable and fitting that the Congress should, after due consideration, declare that—

(*a*) When the plans of public and private buildings are submitted, the chief of the fire brigade of the locality should be invited to the inspection of the site held before the delivery of the permit to build, not only in the interests of security from fire, but also in order that he may, in virtue of his experience, likewise make his remarks upon the plans for the projected structure.

(*b*) In the case of a serious conflagration, a report upon the special experience gained thereat, with reference to similar experiences at the burning of other large buildings, pointing out the aids or obstacles to the extinction of fire, which arose from the method or material of construction, shall be presented to the local building committee for their information in examining future plans.

In order that my third proposition may, in the event of its acceptance, have as large scope as possible, I beg to complement my last suggestion by putting forward a fourth, *i. e.*, that the Congress should declare that the Technical Commission of the International Fire Brigades Council, or some other similar body, should publish a special journal or record in three languages (English, French, and German), in which the experiences acquired during the extinction of fires, especially the causes which have hindered or helped their extinction due to the system of construction, should be reported. These data should be furnished by the fire brigade officers to their respective national associations for transmission to the Technical Committee of the International Fire Brigades Council.

I would finally suggest that any decision or resolutions of this Congress either on any one of my proposals, or proposals in connection with other papers, should be communicated by the delegates of the States here represented to their respective Governments, in ordr that the latter may take the necessary measures to give them immediate consideration.

FIREPROOF CONSTRUCTION

Does It Afford Added Fire Protection?—Combination of Materials of Construction—The Exposure Hazard—Extract of Paper by Hon. Perez M. Stewart

The lack of space prevents our using the whole of Mr. Stewart's article, and, in consequence, we have selected such portions of it as will give a substantial outline of the whole article without in any way destroying its sense. The following paragraphs are taken from his article:

Fire protection is a term broad and elastic. Roughly speaking, like "All Gaul," it may be divided into three parts. First—The protection from without afforded by the municipality. Second—The ability of the building itself, in consequence of its structural excellence, to withstand the effects of fire, either from within or from without, and, third—the multitude of fire detecting and fire-fighting devices installed in, but not integrally a part of the building itself.

As an expression of the importance of technical investigation on the subject of fire prevention, and fire preventing methods, I can cite no better proof than the several collegiate courses and testing laboratories which have been established to deal with this subject all over the world.

A careful consideration of the matter of fire protection should convince every owner that the introduction of safeguards against fire will bring a fair return in reduced rates on the increased outlay, besides fulfilling a moral obligation which he owes to his lessees, tenants, neighbors, and himself.

In considering the manner in which construction tends to reduce the fire hazard, we find that the subject naturally divides itself into three heads: 1st—the use of incombustible and fireproof material. 2d—the manner of combining the materials of construction. 3d—the provision of devices and forms of construction that afford protection against fire from the outside.

The advantage in the use of incombustible materials is almost self-evident, as thereby the food for fire is reduced in the same ratio in which incombustible materials are used.

Importance of Arrangement of Constructive

It will thus be seen that the manner of construction or the disposition and arrangement of parts of construction is even more important than the use of incombustible material. It is contended by many, and with a good show of justice in the claim, that with the proper use of ordinary combustible materials (which practically means wood), for the interior work of buildings, a structure can be made as safe against the spread of fire as if nothing but incom-

* Former Superintendent of Buildings, New York, who read the paper at the convention of International Association of Fire Engineers held at Atlantic City, N. J., September 8-11, 1903.

bustible materials were used. Where wood is used and is exposed, it should be so placed that as little surface is exposed as possible. A fire will spread with greater difficulty when the flames have only one side to work on and the supply of air for the combustion is limited. The selection of the wood is of great importance. Hard woods are much more difficult to burn than softer woods and sustain the flames less readily. Oak and yellow pine make the best structural materials among the different kinds of woods. Ordinary paints, and especially varnishes, should be avoided.

The danger of the spread of fire in a building increases first, with the increase in area covered, and second, in greater degree with the increase in height.

The danger is met in the first instance by providing fire stops in the way of brick walls or fireproof partitions. Any openings that may be necessary in these partitions should be provided with fireproof doors and windows.

The spread of fire in a vertical direction is undoubtedly most effectively guarded against by making the floors continuous and unbroken, that is, eliminating all openings in the floors and placing the necessary means of communication, such as stairways, elevators, pipes, shafts, belts, etc., in shafts entirely separated from the rest of the building by brick walls. A close attention to this detail is very important. In one of our early fireproof office buildings there occurred a fire some years ago in which the greatest damage was done in an officie two stories above the one in which the fire originated. The flames in the lower story burned away the woodwork casing around the smoke or drain pipes and were drawn up through the openings in the floor for the pipes, and in this way ascended to the upper story, where they destroyed the pipe casing and set fire to the contents of the room.

In this incident, too, is shown the danger in the use of furring and casing, especially when of wood. Air spaces are thus formed which constitute channels through which fire, by creating draught in them, is spread. All casings, wainscoting, trim, etc., should be solidly backed up with some incombustible material; or in case it is impracticable to so back them up, good and sufficient fire stops should at least be provided at intervals. In non-fireproof buildings where wood floors or stud partitions are used, a judicious use of fire stops is very desirable. In the spaces formed by wood floor beams, the floor and ceiling act as a flue through which the fire spreads very rapidly; so do the spaces between the treads in the soffits of stairs. In the case of wooden stairways, it is very desirable that fire stops of some incombustible material should be provided. Steam coal ashes of similar incombustible materials placed flush with the floor beams make not only an excellent fire stop by protecting the floors to a great extent, but serve the additional purpose of deafening or preventing the transmission of sound. In fireproof floors where wood flooring is used secured to wooden sleepers, it is very important that the space between the sleepers up to the underside of the flooring be filled in solidly with some incombustible material.

Use of Wire Glass

Reference has already been made to the elevator shaft as a very frequent means of spreading fire. The shaft in its construction constitutes a flue up which a fire is drawn with great force. On account of the necessarily large openings of each story, particularly in the case of freight elevators, the danger of communicating fires is great. The construction of the shaft and enclosed apparatus therefore becomes a matter of great importance. The shaft walls in the first place should be absolutely fireproof, and constructed of incombustible materials. The requirements of the Department of Buildings of New York City, to which any construction before being approved for use as enclosing walls for elevators must be submitted, cannot be said to be too severe. These requirements are that the proposed construction shall practically remain intact after being exposed to a fire maintained for one hour at a temperature of 1,700° Fahrenheit, and then subjected to a stream of water at thirty pounds' pressure for five minutes. Any construction that is used should be self-supporting. Such iron work as is necessary for the construction of the shaft should be thoroughly protected by fireproof covering. No woodwork whatever must enter into the construction. The necessary openings must be provided with fireproof doors. Where it is necessary to provide light, and it cannot be obtained by windows opening directly to the outer air, it can be secured by window lights in the doors; or, if that is not sufficient, by stationary metal sashes set in metal frames. In all cases the windows should be glazed with wire glass.

Pipe shafts should be solid for their full length. Provision should be made for expansion and contraction, so that the openings for service pipes at each story can be completely filled up by the pipes without danger of damage to either pipe or partition.

But, coming to the third division of our subject, in a closely built up location, no matter how much care or money has been expended upon a building to make it safe against fire within itself, there still remains the danger of fire damage, if not destruction, from the outside. Insurance underwriters generally regard a brick wall increasing in thickness from the top down as the most satisfactory protection against the attacks of fire from the outside.

The Exposure Hazard

One of the most potent natural conditions tending to augment the fire loss is what is known as the exposure hazard. This defines the likelihood of a building to become ignited by a fire from without the walls. Tables of fire loss, covering a number of years, show that nearly one-third of the fire loss of the country is due to the exposure hazard.

Since wall openings must normally be open more or less of the time either to traffic or to the passage of light, the first form of protection took the obvious form of a sheet iron door or shutter, arranged to be closed at night. Practical experience, however, soon showed that any considerable amount of heat warped the sheet iron shutter to such an extent as to seriously impair its usefulness. A great improvement on the iron shutter came with the design of the tin clad wooden shutter, a device without a superior for many forms of wall opening protection. As applied to the windows of mercantile establishments, however, the tin clad shutter shared with the sheet iron shutter several defects. It did not admit a night fire in a building to be seen from the outside; it did not lend itself readily to the adaptation of devices to close the shutter automatically in the event of fire, and it was very unsightly.

A substitute which eliminates these weaknesses, besides possessing many added advantages, is to be found in the fireproof window glazed with wire glass, set in sash and window frame covered with metal. This window is made in a number of different styles, some with sash of wood covered with metal, some with hollow sash of metal.

Wire glass is made either with an opaque or polished surface, and the wire reinforcing, embedded in the glass itself, although keeping the window intact against the attack of a fire of almost any intensity, may be broken readily by the fireman when it becomes necessary to enter the building or introduce a fire stream.

The walls of buildings, wherever practicable, should extend two or three feet above the roof level. This is absolutely essential in the case of parapet walls, or walls adjacent to other buildings, to prevent the creeping of fire along the roofs.

Roof coverings must always be of some fireproof material, such as tin, iron, slate or tile, and where openings exist a filling of wire glass skylights. These materials best resist the passage of heat from falling embers, or flames lapping over the parapet walls. The tile and slate are slower in transmitting heat than the iron or tin, and for this reason perhaps, afford a better protection.

Fires do, and probably always will, occur even in fireproof buildings, as it is impracticable, if not impossible, to eliminate combustible furnishings in our dwellings, offices, and even our workshops. In addition to the instances already given, others could be cited where fires originating in fireproof buildings have been positively confined to the lofts or rooms in which they started, and in which the buildings themselves suffered no further injury than a discoloration of the paint, breaking of the window glass, etc. Such cases, it seems to me, undoubtedly prove that the fire hazard is reduced by proper fireproof construction and added protection given.

STATE POLICE DEPARTMENT FOR CONNECTICUT

A BILL creating a State police department for Connecticut was signed by Governor Chamberlain of that State the last of May. The following is a summary of the sections of this act:

Sec. 1. There is hereby established a State police department, which shall be under the management of a board of five commissioners, to be known as the commissioners of State police. Said commissioners shall be appointed by the judges of the superior court, at their annual meeting in June, 1903, and biennially thereafter, and shall hold office for a term of two years from and after the first day of July next succeeding their appointment, and until their successors are appointed. Should a vacancy occur in said board the governor shall have power to fill said vacancy until the next annual meeting of the judges of the superior court. Said commissioners shall serve without pay, but their necessary expenses while in the performance of their official duties shall be paid by the State, as hereinafter provided."

After the commissioners have organized, according to Section 2, they shall elect by majority vote a superintendent and assistant superintendent of the department. These elections shall occur biennially. "Upon the recommendation of said superintendent said board shall appoint not less than five men, and, in their discretion, as necessity may require, may, upon the recommendation of said superintendent, appoint not more than ten men in all who shall be known as State policemen." The superintendent and his assistant are to hold office two years and the State policemen at the pleasure of the commissioners. But the superintendent is to have the power to discharge any policemen in excess of five when the needs of the department require. The commissioners shall have the power to suspend or remove, upon charges and after a hearing, the superintendent or his assistant and appoint others. They can also fill vacancies among said appointees, and shall prescribe rules for the government and discipline of the force and the duties of its members.

The headquarters of the force is to be at Hartford, where, as permitted by the third section, the superintendent may spend $2,000 per year for quarters and clerical help.

"Sec. 4. Said department, when requested by the governor, the attorney-general, any State attorney, coroner, or any other legally appointed prosecuting officer in the State, shall, whenever practicable, and in all reasonable ways, assist in the investigation, detection, and prosecution of all criminal matters within the jurisdiction of the officers making such request, and the superintendent and assistant superintendent of said department, and any State policeman, shall have and may exercise, in any part of the State, the same power with respect to criminal matters, and the enforcement of the laws relating to intoxicating liquors and gaming, as sheriffs, police, or constables now exercise in their respective jurisdictions. Said department shall also render assistance, when requested, if practicable, to any sheriff, or chief or superintendent of police in any part of the State. Whenever said State policeman shall not be engaged in any specific work as provided for in this section, they shall, under such rules as may be made by said commissioners and under the direction of said superintendent, use their best endeavors to prevent crime, preserve the peace of the State, and to secure the detection, arrest and conviction of offenders."

"Sec. 5. On and after July 1, 1905, the fire marshal of every city or borough having such an officer, the chief of the fire department of every city, borough, or fire district having a fire department and not having a local fire marshal, and the warden of every borough and the first selectman of every town having no local fire marshal or chief of a fire department, shall make all reports concerning the origin and character of fires, now required by law to be made to the State fire marshal, to the department of State police, and on and after said date the superintendent of said department shall have and exercise all the powers and be subject to the same duties theretofore incumbent upon said State fire marshal; provided, however, that any State policeman, under the directions of the superintendent of said department, and for the purpose of ascertaining the origin or characters of any fire, shall have power, at any time, to enter into and upon the premises of any building where a fire has occurred, or the premises or buildings adjacent thereto, and to perform such other duties in regard thereto as said superintendent shall direct."

The State fire marshal shall not be appointed to hold office after July 1, 1905, according to Section 6.

"Sec. 7. Any member of said State police department may request any sheriff or deputy sheriff in any county, any policeman of any city, or any constable of any town to assist in the investigation, detection and prosecution of criminal offenses within his jurisdiction, and such officer shall, when so requested, render all reasonable assistance, and shall be paid as hereinafter provided. Any sheriff or constable may, and any deputy sheriff or policeman, with the consent of the authority to which he is subject, shall go to any part of the State when required by the superintendent of the State police, and while acting under the authority of said superintendent shall have all the powers conferred upon State policemen under the provisions of this act."

Section 8 fixes the salary of the superintendent at $3,000 per year, of the assistant at $2,000, and of the policemen at not to exceed $4 a day at the discretion of the commissioners. An itemized account of expenses must be submitted to the superintendent.

The bond of the superintendent, as stated in the ninth section, shall be $10,000, that of the assistant at $5,000, and those of the policemen to be fixed by the commissioners. Oaths of office must be taken and bonds filed within ten days after appointment.

"Sec. 10. Any State police officer appointed as provided in Section 2 of this act, who directly or indirectly receives a reward, gift or gratuity on account of his official services, except as approved by the commissioners, or to influence his behavior in office, shall upon conviction therefor, be punished by a fine not exceeding five hundred dollars, or by imprisonment not more than six months, or by both such fine and imprisonment, and shall be dishonorably discharged from said department."

The superintendent, as the eleventh section provides, is to render the commissioners a report of the work whenever required to do so. The commissioners are to report to the governor in October of each year.

"Sec. 12. Whenever, pursuant to the provisions of this act, any State policeman or officer shall appear as a witness in any case, the court before which the case is tried shall tax such sum to be paid as costs as, in his judgment, may seem reasonable for time and expense, and said policeman shall duly receipt for all sums so received and immediately pay them over to the superintendent of State police. Whenever any sheriff, deputy sheriff, policeman or constable shall do any service under the direction of the superintendent of State police, or at the request of any member of said department, he shall receive therefor such sum as may be agreed upon, not exceeding five dollars per day and expenses to be paid by the superintendent of State police." Whenever these officers shall be required as witnesses, the court shall tax the sum to be paid as costs so that the officers shall receive for their services an amount that seems reasonable to the court. The officers shall receipt for the same and turn the money over to the State superintendent, who in turn shall transfer it to the State treasurer.

The thirteenth section places the superintendent in direct charge of the State force and makes him responsible for the moneys collected and expended, and provides that he shall pay the latter, including the salaries of the policemen. Orders on the State treasurer must state specifically for what the money is to be used.

Section 14 provides that the assistant superintendent is to act in the absence or disability of the superintendent.

The fines and forfeited bonds in cases in which any evidence has been furnished by the State police of any officer thereof shall be equally divided, according to Section 15, between the State and the towns in which the fines are imposed or bonds forfeited, and the superintendent is to collect one-half of thefines and forfeitures.

Sections 4 and 5 of the law incorporating the Law and Order League of Connecticut are repealed by Sections 16 and 17.

Deputy Sheriff Thomas F. Egan, of Southington, was appointed State superintendent.

MEETING OF INTERNATIONAL FIRE CHIEFS

Convention at Atlantic City Well Attended—A Number of Good Papers Read—Goes to Chattanooga Next Year

The attendance at the thirty-first annual convention of the International Association of Fire Engineers was larger than had been anticipated when the convention opened at Atlantic City, N. J., on the 8th of September. Mayor Stoy welcomed the delegates to the city and his words of greeting were responded to by Capt. William Brophy, of Boston, and Chief James Devine, of Salt Lake City. Praper was offered by Rev. C. D. Sinkinson, of Atlantic City. President Edward F. Croker, ex-chief of the New York fire department, presided at the sessions.

The Papers that Were Read

The first topic for discussion was a paper by Chief Harris, of Tampa, Fla., on "Should Firemen Be Members of Labor Unions?" Chief John Thompson, of Toronto, was also to read a paper on this subject, but was not permitted to do so.

The paper on "Explosive Compounds Other than Gases—How Should They Be Stored and in What Quantities?" read by Chief Horton, of Baltimore, was short but very good, the Chief handling his subject well.

Topic 3, "Deadly Fumes from Acids and Chemicals," was taken charge of by Chief Henry R. Yates, of Schenectady, N. Y., and is presented on another page of this issue. The death of Chief Foley, of Milwaukee, was brought back to those who heard this paper. This and the preceding topic elicited much discussion that will be helpful to the other members.

Capt. William Brophy, of Boston, read a long paper on "Should the Chief Have Absolute Command of the Fire Department?" The views he presented met with hearty approval from the members.

"Fireproof Construction, and Does It Afford Added Fire Protection?" was the subject of a paper read by Mr. Perez M. Stewart, former superintendent of buildings of New York.

"First Aid to the Injured at Fires" was looked after by Chief Edward H. Mersch, Evanston, Ill. A special committee was appointed at the convention last year to report on a topic treated at that convention by Mr. Henry E. Hess, manager of the New York Fire Insurance Exchange, namely, "Are Cities and Towns Keeping Pace with Improvements in Fire Protection in Proportion to the Increase of the Conflagration Hazard?" Much to the disappointment of the association no report was made by the committee.

CHIEF W. R. JOINER, ATLANTA, GA.,
President, International Fire Chiefs' Association

Officers for 1903-4

There was not a little friction over the choice of president for the coming year, Chief M. S. Humphreys, of Pittsburg; Chief M. W. Bronson, of Larchmont, N. Y.; Chief W. R. Joyner, of Atlanta, Ga., and President Croker being candidates. The choice fell on Chief Joyner, while Chief John Stagg, of Paterson, N. J., and Chief George Kellogg, of Sioux City, Ia., were chosen first and second vice-presidents, respectively. Secretary Hills and Treasurer Larkin were re-elected unanimously. Chattanooga and Milwaukee were strong rivals for the next meeting place, but several ballots finally resulted in the choice of the former place.

The visiting chiefs and friends were well entertained by the city. On the evening of the 9th, "A Night in Bohemia," at the "American Garden," was attended by a large number. On the afternoon of the following day the members were taken on a trolley ride to Longport and back, and on Friday a trip on the ocean in launches from the Atlantic City Yacht Club was enjoyed. The ladies who attended the convention were not forgotten and a number of entertainments were enjoyed by them. The badge presented to the chiefs this year was of gun metal, and very neatly gotten up, being one of the best that has been used.

The chiefs at the convention had the opportunity of witnessing a parade of the fire department of Atlantic City. A number of other other organizations were in line, such as the Courtlandt Hook and Ladder Company, of Peekskill, N. Y., the Volunteer Firemen's Association of Philadelphia, and companies from Rahway, N. J., South Bethlehem, Pa., and Vineland, N. J. Chief of Police Eldridge and other officials of the city rode in carriages.

The Exhibits

The exhibits at the convention were not numerous, and to those that attended the convention at New York last year seemed very insignificant as far as display was concerned. They were made under the direction of Chief Weisenthall and assistants. The automobile chemical engine of the LaFrance Fire Engine Company was tested by making a fairly long run and then getting to work as soon as the machine had been stopped. The machine was loaded with a crew, and, while it was run at great speed, did not cause them any inconvenience.

The American Fire Engine Company also exhibited its "Kaiser" pneumatic aerial truck, and the exhibition was very successful, the ladder being run up in about eleven seconds. One of the Atlantic City firemen quickly mounted it, other members of that department having assisted in operating it. The same company also showed its sixth class "Cosmopolitan" fire engine. This was placed along side of a first-class engine to show the difference, yet the work of the small machine was out of all proportion to its size, giving a good stream.

The Glazier Universal Nozzle was exhibited on a Holloway chemical and hose wagon, one and one-half and two-inch streams being thrown. The nozzle worked well and was favorably commented upon by the spectators. A new fireman's appliance was shown by the American Smoke Mask Company, of New York.

Mr. Diggs gave exhibits of his fire extinguishers. He showed the workings of the Diggs chemical tank, for use on hook and ladder trucks, hose wagons, etc. The Diggs Company makes a specialty of building chemical engines for installation on apparatus already in commission, thus giving to departments a combination at a small outlay. Those that have been installed are giving the best of satisfaction.

The Gamell Fire-Alarm Telegraph Company were represented at the convention by Capt. H. M. Cross, from Cincinnati; Mr. F. C. Stover, from the Chicago office; Mr. O. P. Crocker, from that in Atlanta; Messrs. Wm. H. Kiman and T. Torey, from the New York office, and Mr. Albert H. Cross, of the Gamewell Auxiliary Fire-Alarm Company, New York.

WHAT POLICE AND FIREMEN ARE DOING

Indianapolis Makes Improvements—New Fire Appliance in London—Firemen's Pensions in Syracuse—Last Report of Chief Foley—Personals

Improvement in Indianapolis Fire Service

It has been proposed to increase the pay of the Indianapolis firemen when the budget for the coming year is made up. At present the firemen receive $2.25 a day regardless of the length of service and captains $2.50. The new scheme will add about 10 per cent. to the salaries and grade the men so that there will be some inducement for a fireman to give good service. The first grade, composed of those who have served two years or more, are to receive $2.50 a day. The second grade or those who have served a year, $2.25, and the third grade of less than one year service to receive $2. Substitutes are to have $40 a month. At present they receive $2.25 a day but only for the time they are actually employed. Captains will receive $1,020 a year and lieutenants $960. The latter now receive the same pay as firemen.

A New Fire Appliance

As the result of one of the last recommendations of Captain Lionel Wells, the late chief officer of the Metropolitan Fire Brigade, a new appliance has been added to those at headquarters. It is known as a first-aid machine, and is to be sent out on the horsed escape, which is always in readiness for instant despatch on receipt of a call. The appliance comprises two cylinders, a large one containing air and water, and a smaller one containing compressed air, with a pressure of 1,000 pounds to the square inch. The method of using the appliance will enable water to be played on a small fire at a high pressure, pending the arrival of the steamers.—*Municipal Journal, London.*

Fire Alarm Boxes Equipped with Telephones

Every alarm box in Salt Lake City, Utah, is to be equipped with a telephone which has been devised by City Electrician Charles T. Vail. Each box is provided with a "jack" into which can be inserted a plug, thus connecting the wires of the alarm circuit with a portable telephone that each chief and assistant chief will carry in his wagon. The operator at the central office can tell what box is calling by a number that will be displayed in an enunciator box in the office. Instead of having to signal by an alarm when more hose is needed, with the consequent danger of the alarm being misunderstood, the firemen can ask assistance by telephone. This system is in use in some of the English cities and has proved of great convenience.

Fire Brigade of Birkenhead

The fire-brigade of Birkenhead borough, England, was formed in 1894. Previously the police had charge of the fire appliances which consisted of one hand engine, six reels and four escapes. Whenever a call came in it was necessary to gather the men, then to get the apparatus to the fire that might be a mile away from the station. A serious fire in 1893 directly opposite one of the stations brought the authorities to their senses. A member of the metropolitan fire-brigade of London was entrusted with the formation of a permanent brigade. In 1894 six permanent men were appointed, a 450-gallon steamer and up-to-date appliances obtained. Then a modern fire station was erected at a cost of $17,500 and thirty-four alarm boxes located in different parts of the borough. Two branch stations were installed, and in each were placed a man and hose cart. A larger steam engine was later purchased, although there is sufficient pressure in the street hydrants for use in the majority of buildings. A horse ambulance has been placed in the central station, and the brigade respond to accidents, treating hundreds of cases and removing many to the hospitals. All the men are skilled in first aid to the injured. In 1901 a horsed escape was obtained and a horsed chemical engine will be the next acquisition and will prove valuable.

The personnel of the brigade consists of one superintendent, an assistant, an engineer, two assistant engineers and eleven firemen. There are also attached four police and six civilians. The permanent men are allowed two leaves of absence per month in addition to annual leave in proportion to the rank of the individual.

Report on 'Frisco Police

The work of the police department of San Francisco, Cal., appears in the report of its chief, George W. Wittman. The report shows that there were 29,336 arrests during the year of which 15,766 were for drunkenness, the largest number for any one offense. Disturbers of the peace numbered 1,968 and vagrants 2,233. Arrests for spitting on the sidewalk numbered 551, those for grand larceny 258 and for petit larceny 606. Of the total number only 421 were for felonies. Only a little more than one-half of the property reported stolen was recovered. There are 678 men in the department and eighty-eight men are on the pension list. Eight men were dismissed during the year. The commissioners imposed $2,601 in fines. The detective bureau made 360 arrests for felonies and 794 for misdemeanors. Six hundred and forty-three persons were measured by the Bertillon system.

Chief Wittman believes in the planting of street trees for they operate to advantage in checking the spread of fire. He says: "In the first place, they would act as a windbreak, keeping sparks and cinders from setting fire to houses on the opposite side of the street from a fire, and in the second place, they would shield those houses, preventing them from catching fire from the heat."

Firemen and Live Wires

Heincke, in the *Electrische Zeitschrift*, gives a description of experiments made to ascertain whether there is any danger, and of so how much, of firemen being exposed to shocks by the stream of water which is thrown from the hose striking against a live wire. The author experimented with ordinary hydrant water, which in his case was not a very good conductor, and also with water to which was added 0.5 per cent. of soda to make it conduct better. The copper nozzle of the hose was very well insulated from earth and the potential of the stream of water against the earth was measured with precision voltmeters. From these potentials he calculated the current strength, based upon the resistance of the human body of 15,000 ohms, as ascertained by Prof. Weber in Zurich.

Experiments were conducted with triphase current of 6,000 volts and 125 volts, and direct current of 240 volts and 550 volts with both kinds of water mentioned above. The experiments with triphase current were conducted with star connection, 6,000 volts between two lines, the neutral wire being earthed. The places where the stream of water struck the wires had been previously bared. It was shown that with ordinary water a length of the stream of 300 mm. is sufficient to render the effects of the electric current on the body harmless, while with 0.05 per cent. soda in the water the minimum length is 1,000 mm. It is to be remarked, however, that disagreeable sensations still show themselves in the body of the person under consideration.

With 550 volts direct current and pure hydrant water, a dangerous potential was also not obtained, but with the good conducting water it showed itself at a distance of 80 mm. It is shown by these tables that the danger resulting from the playing of water on current-conducting wires is not by far so great as had previously been thought and feared, especially if it is considered that perhaps only in the rarest cases will wires which carry a potential of three times 6,000 volts come into consideration.—*Electrical World and Engineer.*

Last Report of Chief Foley

The last report of the fire department of Milwaukee, written by Chief James Foley, before his death was the twentieth of his and the thirty-second of the paid department of the city. During 1902 the department responded to 1,692 alarms or 289 more alarms than for the preceding year, and the most alarms for any year in the history of the department. The total loss for the year amounted to $[illegible],226.70 as far as could be ascertained and the total amount of insurance involved was $22,793,644.47. There were thirteen serious fires or those where the loss was from $5,000 to $85,000. No fire got beyond the building where it originated and the majority of the large fires were practically confined to the place of origin. The actual number of fires for the year was 1,448 and the loss per fire $331.65. The superintendent of fire alarm telegraph reported that there were 398 boxes in service of which 284 were keyless pattern. The entire force amounted to 339 men, including the chief and six assistants, and were divided among twenty-three engine companies, and nine truck and chemical enging companies.

Recommendations of Portland's Fire Chief

The fire department of Portland, Ore., as presently constituted, is composed of 138 men including one chief, an assistant chief, two district engineers, superintendent of fire alarm telegraph, seven steam fire engine companies, four chemical engine companies, four hook and ladder companies and five hose companies. The force is a call one but Chief David Campbell again, as in other years, recommends that it be placed upon a permanent basis. The call men are assisted in their work by five auxiliary volunteer fire companies in the suburban districts. The department has in service 22,000 feet of cotton rubber lined hose and 1,400 feet of rubber hose, but the Chief recommends that 3,000 feet of two and one-half inch cotton and 2,200 feet of one and one-half inch cotton hose be purchased. He also asked that two engine companies, a truck company, a water tower, a fire-boat and a fuel wagon be added to the force. Since his recommendations were made the city has let the contract for a fire-boat. Chief Campbell also asked that the hydrants be under the charge of the Board of Water Commissioners, who can set all hydrants much more cheaply than the fire department and especially when the mains are being laid. The number of alarms amounted to 439, of which thirty-nine were false and 201 for actual fires. This is fifty-three alarms more than were ever received before. Superintendent George J. Walker, of the fire alarm telegraph, renews the recommendation for a better system and calls attention to the danger of serious loss if the system should break down at a critical moment. The system is an automatic one and there is great danger that two boxes will be pulled at the same time and so both numbers be lost. All devices attached to the boxes to prevent interference have not proved efficient. He recommends that the manual method of sending out alarms from the central office be adopted and makes the cost of the same to be much less than that of the automatic. In addition to the present boxes he recommends that 100 new ones be installed. No two contiguous boxes should be placed on the same circuit.

Pensions for Syracuse Firemen

The last Legislature of New York State passed an act amending the laws relating to the firemen's pension fund for Syracuse. It provides that an assessment of 1 per cent. shall be levied on the salaries of the uniformed force to be deducted monthly by the comptroller and all rewards, fees, gifts, etc., that may be given for extraordinary service except such as the commissioner of public safety may permit the recipient to retain. The proceeds from the sale of all old, condemned or unfit property when the same does not exceed the sum of $250 for any one article, shall go into the fund. The mayor, comptroller, and commissioner of public safety are to be the board of trustees of the firemen's pension fund. The comptroller is to be ex-officio treasurer of the fund and the treasurer is to be bonded in a sum equal to at least double the amount of money in his hands at any one time. The board is to make all rules and determine all applications for pensions and its members shall be responsible for the granting of any pension not made according to the law. Any member of the department, who, upon examination by the surgeon, proves to be unfit for service physically or mentally, by reason of long service, disease or disability due to the actual performance of the duties of his position without fault or misconduct on his part, shall remain under the orders of the board of trustees who may order him to do such duty of which he is capable and for which he shall receive full pay. Any fireman as above who shall be permanently incapacitated for performance of his duty may be retired by the board on half pay. Any fireman who has served twenty years may, upon application, be retired on half pay. The widow of any fireman who dies while on duty and who has served ten years or who dies after retirement or discharge for disability, shall be allowed a pension of $25 per month to cease upon her death or remarriage. To the child or children if there be no widow or if she die the sum of $25 a month is to be paid, and if there be a widow, each child is to receive $5 a month if the fund permit. Dependent parents, if there be no widow or children, shall receive $25 a month but only one pension shall be issued. Except in the case of firemen who serve twenty years, the board of trustees shall use its discretion regarding the granting of pensions.

Fire and Police Personals

—Former Chief John H. Morton, of Hackensack, N. J., died on September 3 from heart trouble. He had resigned as chief but a few weeks previous, after having done much to improve the department.

—Mayor Osborne, of Auburn, N. Y., at a public meeting severely criticised the police department for the alleged indifference of its members to their duties, lack of discipline, and too much attention to "picturesqueness."

—In recognition of twenty-three years' of faithful service, Janesville, Wis., presented a handsome gold badge and a purse of money to City Marshall John W. Hogan. Mayor A. O. Williams made the presentation speech.

—Chief of Police J. C. McClune, of Bolivar, Pa., has been charged with murder. While endeavoring to arrest a man at the request of one of the residents, a struggle ensued and the Chief shot his opponent in answer to a stone hurled by the latter.

—The Police Commissioners of Waterbury, Conn., exonerated Chief of Police George M. Eagan from all blame in connection with the charges brought against him by a citizen, who declared that the Chief had failed to see that licenses were issued and paid for by certain amusement houses. No evidence was produced to prove the charges.

—Chief H. A. McQuade, of Chattanooga, Tenn., where the next meeting of the International Association of Fire Engineers is to be held, says he will at once get to work on preparations for the coming convention. By starting early there will be plenty of time for carrying out whatever plans are made and nothing will have to be done in a hurry at the last moment.

L. C. Varnedoe, formerly a driver of Engine 6 of the Atlanta, Ga., fire department, has been selected by the city of Valdosta, Ga., as chief of its new department. The department has been reorganized and new equipment will be obtained. Chief Varnedoe has been in the Atlanta department since 1894, and proved himself an able fireman. He comes from one of the best families in the State.

—As an example of what visiting other departments will do for a chief, the recent trip of Chief George W. Wallis, of Superior, Mich., gave him an insight into how the Chicago and Detroit departments take care of fires. He visited the departments of other cities, where he had an opportunity of seeing the equipment they had in use and got a good many points for improvements in his own force.

—Chief W. R. Joyner, of Atlanta, who has been elected president of the International Association of Fire Engineers, will start at once on the work of improving the affairs of the association. He will at once get in touch with the authorities of the different cities of the country and urge upon them the necessity of making provision for sending their chiefs to the convention next year. Chief Joyner is well known throughout the South, and has a great deal of influence with many of the authorities in cities in that section, and it is to be expected that he will succeed in great measure in his work.

LITERATURE ON MUNICIPAL TOPICS

Reviews of Some Important Books—What the Magazines and Reviews Have to Say About Civic Affairs—Municipal Reports Received

Books

THE tenth annual volume of *American Street Railway Investments* has been issued. In it are the reports from 1,361 companies, giving the physical and financial condition of the properties; in all but sixty-one the information coming officially from the companies. This year the reports are arranged by States, instead of by towns, as heretofore. A number of maps are included, showing the important railway systems of the country. The date of the information is noted at the end of each report. This book is published by *The Street Railway Journal*, New York, for the use of bankers, investors, street railway companies, and others. Price, $5.00.

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The report of the American Public Health Association, containing the papers presented at the thirtieth annual meeting held at New Orleans last December, has made its appearance and will prove a valuable book of reference for members of the association and health officers in general. There are 550 pages devoted to subjects that are of interest to all that deal with the health of cities. The views of eminent men in this field appear throughout the papers and discussions, while the reports of the committees will prove valuable. The book is cloth bound and is the twenty-eighth one issued. Dr. Charles O. Probst, Columbus, O., is the secretary of the association.

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A small volume of essays, the principal ones being *The Transaction of Buisness*, by Sir Arthur Helps, and *How to Win Fortune*, by Andrew Carnegie, has been issued under the editorship of David E. Goe. It is a collection of ideas, wisdom and advice of men who have made a success in their different callings and should prove both interesting and valuable to other men of business. Extracts from Francis Bacon and Elbert Hubbard have been included. Published by the Eddy Publishing Company, Madison, Wis.

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The suit brought by the State of Missouri and the city of St. Louis for a Federal injunction against further operation and development of the drainage canal of Chicago because of the injury to the water supply of the former city had for one result the investigation on the part of the Chicago authorities of the chemical and bacteriological conditions of the streams between Lake Michigan and the Mississippi. The report has been issued and will prove of interest outside of the recent contention because of the immense amount of data collected respecting the waterways of Illinois and the way in which the authorities of Chicago went to work to gather the data. Dr. Arthur H. Reynolds, commissioner of health of Chicago, had charge of the work and the report was published by authority of the Trustees of the Sanitary District of Chicago.

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The subject of municipal art and the beautifying of cities is proving of more and more interest to residents and officials of cities in the United States as in Europe, although the cities on this side of the water are still far behind those of the old world. The time must and will come when the same thought that is given to municipal art abroad will be taken in American cities either in planning new structures or in improving the old. It will be found just as easy and as economical to take care that improvements are made with an eye to the beautiful as to disregard all sense of art. It often happens, however, that while authorities would willingly and gladly introduce municipal art ideas in planning new streets, buildings or what not, their previous education has not been along lines that would teach them what was the proper thing in the proper place. To these as to all others who are interested in making their cities as beautiful as possible *Modern Civic Art* will appeal. Its author, Charles Mulford Robinson, has made a long study of the city beautiful and, while there will be many who disagree with him on numerous points, it will be simply a disagreement of degree and not of kind or essentials. The one objection to his work will be that it is much too long. The same amount of information could readily have been imparted in fewer words without loss of thought and instead of filling 375 octavo pages would have required not more than 200. The publishers have padded the work considerably by the use of too large type, unnecessarily adding to the number of pages.

In his introduction, Mr. Robinson reviews the present outlook for cities and prophesies for the better day that is coming. He defines civic art "as the taking in just the right way of those steps necessary or proper for the comfort of the citizens—as the doing of the necessary or proper civic thing in the right way." In one respect the word "art" is an unfortunate one inasmuch as it associates in the minds of most people the thought of long-haired artists with all the fanciful, erratic and impracticable ideas of this class. The idea of practicability and common sense is not conveyed. He depends on the word "civic" to differentiate between the practical and the impractical. This explains why the advocates of civic art may care little or nothing for artists in the usual acceptance of that word and why all the residents of cities, those ignorant of art as well as those thoroughly conversant with it, should be in its clientage. The author says civic art "must be delayed in coming until civilization is at its flower, since not dependent on individual and selfish ambition." He recognizes that it will not come all at once, but gradually as the civilization and education of citizens as a mass are improved. He insists that civic art is not effeminate or sentimental in any way, but "vigorous, virile, sane." It has for its object the ultimate health and happiness of the citizens; the prevention of such blots upon cities as slums. Civic art joins utility to beauty. Cities being made to live in, true civic art is but the means of making them more inhabitable and healthy.

The author takes up in succession consideration of the water and land approaches of the city and the administrative centre, outlining the best ways of treating them and showing how they are treated in cities at the present time. Then comes the treatment of the business district, including the street plan, the architecture, the street furnishings and the proper adornments. He next turns to the residential section and the treatment of the large and minor streets and the tenements. Parks, parkways, open spaces, temporary and occasional decoration fill the rest of the pages. There are many good ideas and some new ones throughout the work, but we feel that if the book were cut down to about 200 pages by the elimination of the verbosity, there would be greater likelihood of a larger circulation. Copies may be obtained through THE MUNICIPAL JOURNAL at the publisher's price of $2.50.

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The Forest, Fish and Game Commission of the State of New York has recently issued an illustrated book on *Tree Planting on Streets and Highways*, by William F. Fox, superintendent of State Forests. The author discusses tree planting in general for highways and streets telling the best kinds of trees to set out according to the conditions of the road. The width of the street and sidewalk and the nearness of the houses are factors in selecting the proper species. He takes up the undesirable species, the rapidity of growth, giving the size attained by different trees in twenty years, transplanting and how to do it, pruning, and the protection of trees from their enemies. The cities should have the control of the street trees in the opinion of the author, as the care of the trees can then be assured uniformly all over the city. He gives a short digest of the laws regarding tree planting in various states. A number of fine illustrations show streets well planted with trees and some not so beautified. The last section on "Autumn Foliage" is illustrated by eight finely colored plates showing leaves of some typical street trees in their fall colors.

Periodicals

The issue of the *Proceedings* of the American Society of Civil Engineers for August, 1903, contains a full report of the annual convention of the society held at Ashville, N. C., June 9-12. Among the papers presented in this issue was one by J. L. Van Ornum, on *The Fatigue of Cement Products.* This article, although short, gives the results of some tests of the author tending to determine the action of certain Portland cement mixtures when subjected to repeated loads of a less intensity than would produce failure when applied once. The observations seem to prove that cement mixtures have the property of "gradual fracture" which becomes complete after repetition of a load well within the strength of the material. The work is important in determining as far as possible the factor of safety to use in concretes under various conditions of design. New York, N. Y.

♣

Gunton's Magazine for September has another editorial on the coming municipal election in New York City. Under the title *Permanent Good City Government,* it is stated that the city has now the opportunity of "so strongly entrenching a clean and efficient administration as practically to guarantee permanent good government in this city." It aptly remarks that it is unfortunate that so much of our life is taken up in preparation for elections but claims that "it is a part of that vigilance which is the price of liberty." In speaking of the difference between an "open" and a "closed" town as tending to the prosperity of the city, it states that Tammany Hall favors the former as it considers that vice makes a city attractive when experience shows that the reverse is the case if one would have solid prosperity. Paris is "gay" but New York and London outstrip it as great metropolises and our tastes are not Gallic in our search of pleasure. New York, N. Y. Price $1 a year.

♣

The September *Good Roads Magazine* contains an article on Macadam Road Building, by H. A. Spates, superintendent of streets of Winchester, Mass., and was a paper read before the Civic League of Reading, Mass. The second part of *Oiled Roads and Streets* appears in this number. The kinds of soil that are susceptible to treatment are not restricted as experiments show that all are well adapted to the work. Drift sand takes the oil well and the results are good, but clay being of close structure, is swelled by the oil and becomes spongy, although stronger as the volatile elements of the oil evaporate. *Good Roads in Yucatan* are written of by Charles D. McDowell. New York, N. Y. Price per year, $1.

♣

The Municipal Journal of London for August 21 has a leading article on *Municipal Progress in Margate,* telling of the water scheme that has been put in operation. The New Town Hall of Hull is described and illustrated in the issue of September 4. London, Eng. Price per year, $2.16.

♣

The first two numbers of *Public Works* of London, have appeared, and, to judge from these issues, this magazine promises to be one of the most interesting of papers devoted to the public works of all countries. The magazine is published by the owners of *The Surveyor* and is designed to supplement and complete the work of that paper. The news features of *The Surveyor* will not be included in the new magazine, its articles being long, of a practical value and of permanent use for reference. The magazine is to be cosmopolitan and well illustrated. Among the articles in the August issue are *Pioneers of London Street Reform,* by C. G. Rothery, telling of the designs and work of Inigno Jones and Sir Christopher Wren, and *City Improvements and Housing in Glasgow,* by W. C. Menzies. London, Eng. Price per year, $4.50.

♣

The issue of *Cement* for September contains a number of good articles about subjects in its field. The leader is an article on the *Method Suggested for the Analysis of Limestones. Raw Mixtures and Portland Cements* by the Committee on Uniformity in Technical Analysis of the American Society of Civil Engineers, giving the method as suggested by the committee. Thomas T. Johnston, C. E., contributes a short article on *Gravel as a Concrete Metal* in which he states that he has constructed two large structures using natural gravel without sand as a metal for the concrete and the results have been perfectly satisfactory. *Certain Vexations and Fallacious Cement Tests* is the subject of a contribution from David E. Butler, vice-president of the Society of Engineers of England. He gives the results of tests that were made to show how certain tests of cement are not to be relied upon in all cases. The first part of *The Constitution of Portland Cement,* by Clarence Richardson, appears in this number. It is a review of the literature on the subject and should prove of value to engineers. New York, N. Y. Price per year, $1.

♣

Dr. John McGraw Woodbury, Street Cleaning Commissioner of New York, has contributed an article to *Scribner's Magazine* for October, on *The Wastes of a Great City.* Dr. Woodbury has gone further than the late Colonel Waring to make the street cleaning department one of the most important in the city's administration and this account of his work will be read by other city officials with the greatest interest. He tells of the new incinerator that the department has built on the North river to take care of the rubbish of the city. Materials that are not separated and readily sold are burned and power obtained to operate the plant and light the dumping board, some power being left that is sold to a contractor in the neighborhood. He says: "The incinerator consists of three retorts which are fed alternately by a travelling belt conveyor. The material carted there is emptied from the paper carts directly onto this travelling belt, which is 104 feet in length. On either side of this travelling table stand the pickers who sort from the belt into hoppers at their sides the varying substances that are desired, viz.: one man picks only manila papers, another only spruce pulp papers, another the shoes, another the cloths and rags, another the bottles and cans and all metal substances. These are turned through the hoppers into large presses, where the papers are baled, the shoes are sorted and sold, many of them doing duty, after repair, on the feet of our poorer citizens. But all old mattresses, beds and beddings, are not delivered on this table. They are immediately burned. This is a sanitary precaution rendered necessary by the diseases which they so frequently carried back to the Italian quarters.

"The residue that is not of va lue is fed by this traveling table directly into the furnace, so that the furnace is self-fuelled. The plant was erected by the Department at a cost of $20,000, and was designed by H. de Berkley Parsons, Professor of Steam Engineering at the Troy Polytechnic Institute. The privilege of handling the material brought to this point is sold at $240 per week, making $12,480 per annum, which is a rather good rate per cent. on the amount of money invested. The second of these incinerators for the purpose of handling the waste in the portion of the city below Canal street, is already under construction."

Each day the department picks up eighteen tons of garbage on the East Side streets that is thrown from the house windows. The Russian Jews are the greatest offenders in this line as sanitation in Russia is a thing unknown, all refuse thrown on the streets there remaining until removed by the rain. The department is endeavoring to educate these people in sanitary methods and on the door of each tenant is tacked a notice in Greek, Hebrew, Bohemian, Czech, Italian and Syriac, telling the people what they should do.

He says further: "There are two classes of people equally criminal, who make for the Department of Street Cleaning serious trouble in arriving at the primary separation. There are the ignorant and uneducated poor; but the criminally careless rich and their thoughtless servants make equal if not greater trouble for the department. The worst mixed material thrown into the street may come from the teeming East Side, but the most scandalously mixed material that is hauled to the dumps comes from the Fifth avenue, and is handled by the private ash cart man."

Dr. Woodbury does not describe in this article the obvious method of cleaning the streets, but the devices little known to the public by which the thousands of tons of waste are every day disposed of to the best advantage. Instead of dumping all kinds of refuse into the sea to foul the beaches, Dr. Woodbury uses modern scientific methods. He has made the wastes of New York income producers. New York, N. Y. Price per year, $3.

REVIEW OF MUNICIPAL REPORTS

Sewer System Necessary for Baltimore—Success of Norfolk's Municipal Light Plant—Clearing Wires from Boston's Streets

Mankato's Engineer Reports

DURING 1901 there was considerable activity in sidewalk construction in Mankato, Minn. City engineer J. R. Thompson, states in his report that there were 162,707 square feet of cement walk laid, at a cost of ten cents per square foot, this amount being equal to 5.13 miles of 6-foot walk. It was found that one barrel of cement would make from ninety to ninety-six square feet of walk, depending upon the grade of the sand. There has been a movement on foot to have the roadway narrowed to six feet or less, allowing an increased space for trees and grass, and the city engineer has been encouraging this, as it adds greatly to the beauty of the streets.

Another Plea for Water Meters

THE only way to deal with consumers of water who allow it to run wastefully is to meter the service; they will soon discover that it is cheaper to repair leaky fixtures and be careful of the water than to allow it to run to waste.

"The installation of meters is always in the direction of a lesser consumption." These are the sentiments expressed in the water commissioner's report of Bradford, Pa. At the time of the last report there were only forty-eight meters in the city, twenty-seven of them being of the Pittsburg make. These meters were placed in breweries, machine shops, some hotels, elevators, etc. The experience of the department has been that in unmetered places the consumption averages about one hundred gallons per capita, but on the introduction of a meter, drops to about thirty-five gallons. Supt. of Water Works, S. D. Heffner, is of the opinion that consumers should be metered, as this would give the city plenty of water for years to come and would save thousands of dollars. In view of the fact that a larger supply must be furnished or the consumption curtailed it seems but reasonable that his ideas should be carried out. The water department supplies over $12,000 worth of water to the city departments, for which no pay is received. This sum should be credited to the department. In some cities the custom prevails for the water department to receive the value of the water supplied for fire and city purposes. In this way the water rates are more evenly distributed, for in most cities the property owner, as he does not use water, contributes little to maintain the system while he shares the protection furnished by the fire department for fire purposes.

Municipal Light Plant Does Well

THE installation of the municipal lighting plant at South Norwalk, Conn., was attended with considerable hesitation on the part of many of the residents, but the report for last year of Supt. Winchester, carries out the contention of the advocates of Municipal ownership, that a city plant could be run economically and well, provided proper men were in charge, The cost of running the plant for 1902 amounted to $18,410.69, which amount included interest, repairs, running expenses and salaries. It cost $6,360 to maintain the street lights and this sum should be credited to the department. The lighting of public buildings and the maintenance of the fire alarm should also be added. The income for the year amounted to $24,275.71, showing a gain of twenty-three per cent. over the income of 1901. The expenses for 1902 were fifteen per cent. more than those of the previous year, but the increase in the income left a good surplus, amounting to $5,865.02. Deducting five per cent. depreciation on the present debt of the plant ($55,500) the net profit of the plant would still be over $3,000. It should also be mentioned that the plant has paid on its debts, from its gains during the past three years, over $10,000. Superintendent Winchester emphasizes the fact that the $6,360 paid from the city appropriation for street lighting contains no element of profit, not even the item of depreciation. covering the actual net cost of the service at sixteen dollars for fourteen nominal candle-power arc for all night service, except bright moonlight nights.

The meter rate for electricity has been fixed at ten cents per kw-h. for lighting and five cents per kw-h. for power, with a ten per cent. rebate for prompt payment. Meters are placed wherever there are over five 16-candle-power lamps or their equivalent. When the meters are fully installed, all commercial lighting and power circuits will be operated during the twenty-four hours.

Some of the statistics given in the report are, the capacity of the plant of 2,000 nominal candle-power arcs, 120; average lamp in service during the year, 106; average distance between lamps, five hundred feet; average number of nights lighted, 346; average hours of service, per lamp, 28.75; average rate for 14. c. p. lamp hour received, $2.08; average candle power per hour supplied for one cent, 670; average rate per kw-h received, .0446; average cost per kw. complete, .03389; average cost per kw-h. for fuel, .0124; average income per ton, $11.09; average watt received per pound of fuel, 112.93.

Baltimore Must Have a Sewer System

MORE new work has been done in Baltimore, in the city's engineer department during the past year than for several years previous, although the amount of repair work was about the same. In speaking of repairs to bridges, City Engineer B. T. Fendall tells of a novel piece of work—replacing a temporary wooden structure with a permanant one. This was the use of ferro concrete or armoured concrete on the Lancaster street bridge. Originally it was an iron I beam structure with wooden flooring, the latter being a source of perpetual expense, and unsatisfactory. The iron beams were first cleaned and then covered with coal tar surrounded with concrete. The space between the beams was filled with a floor of 6-inch concrete, reinforced with 6-inch mesh expanded metal. On the top of the concrete was placed a coating of coal tar and to keep out the moisture the whole was finished with vitrified brick pavement. Tests made on this flooring showed that it was strong enough to withstand four times the heaviest load that could be put upon it. City Engineer Fendall does not recommend improved pavements in view of the fact that a complete sanitary sewerags system *must* be constructed soon. It would be unwise to lay good pavements when they must be torn up to lay the sewers.

Boston May Soon Be Free of Overhead Wires

THE work of the Boston Wire Department has been carried on steadily and bids fair to place underground most of the wires within the city limits. The report of Patrick J. Kennedy, Commissioner of Wires, contains a number of illustrations showing how obstructed some of the streets are with wires and a section of the East Boston tunnel with the conduit in which have been laid the low tension wires. In carrying on the work the various electrical companies have found out to their advantage to join in the work of relocation and so made contracts with one firm of tunnel contractors; thus much confusion was avoided. The work has been carried on day and night and was not quite completed up to the time of the report.

The summary of the work of all the companies of the year amounted to 102,338 feet of conduit; 557,879 feet single duct laid; 784,032 feet of cable drawn into the duct, and 327 manholes built. The work of the department in inspecting interior electrical work steadily increases. Five deputy inspectors had been added to the force in 1901 but last year it was necessary to retrench and these inspectors were suspended. The attention of the department was therefore given to all new work and to careful inspection of theatres. There were few fires known to have been due to electricity. The laboratory of the department proved its value many times during the past year in testing various electrical appliances to prove their suitability for the purpose for which they were designed.

Insurance Men on Acetylene Gas Lighting

At a recent convention, held in Chicago, an interesting report of a committee on insurance, in connection with acetylene gas lighting, from which the following extract is made:

"In our interview with Mr. W. H. Merrill, Jr., of the Consulting Engineers of the National Board of Fire Underwriters, we were advised that the recommendation to locate machines outside of, or detached from insured premises, is a recommendation to be applied with some consideration for the commercial interests. The same recommendation is applicable to any lighting or heating device, such as electric wires, kerosene lamps, gasoline lamps and heating apparatus and piped gas, if possible, as all are to a degree hazardous.

"But it is permitted that the competitive interests of the different insurance companies would remain a barrier to such action.

"As the companies represented in the National Board of Fire Underwriters are not bound by the recommendations of their Board of Consulting Engineers, the improbability or even impossibility of action seriously detrimental to the interests of modern acetylene apparatus is quite evident.

"We are also permitted to say, upon the same authority, that other means of lighting, heating and power systems, as installed today, have proven more hazardous, proportionately, than acetylene. Among the most prominent of those mentioned being gasoline, kerosene, electric wires, tallow candles, and by no means the least to be considered, parlor matches, etc., etc., as shown by the official insurance reports on fire losses in the United States, as follows:

1. Electric wires and lights	$16,293,540
2. Oil stoves, lamps, lanterns, etc.	2,777,700
And including 50 per cent. of accidents	3,665,549
3. Stoves and stove pipes	3,175,280
4. Gasoline stoves, etc.	2,221,540
And including 50 per cent. of accidents	3,109,389
5. Matches	2,919,455
6. Natural gas	918,070
7. City gas	675,505
8. Candles	258,475
9. Open fireplaces and grates	235,875
10. Acetylene	30,260
11. Sun's rays	11,965

Making in all eleven prominent features of our great lighting and heating system.

"Spmmarizing, you will note the electric system, with its $16,293,540 losses for one year, is far in the lead of all competitors as a hazard and "left at the post" in the race for safety; while acetylene with its $30,000 total losses (only $13,260 of which was covered by insurance) trails gracefully in the rear as a hazard, and leads all artificial lighting systems in the free-for-all class race for safe systems; its only close competitor being the rays of the sun, while its nearest companion in artificial comfort to mankind is the good old fireplace. As a good, safe system requires some competitive companionship, we trust the last mentioned elements of light and heat will not be penalized to the prohibitive degree for their hazardous natures, though it has been suspected that the Eastern Boards under recommendation and stress of the superior reasoning of our friend, Mr. Atkinson, may demand that all buildings insured in their companies must be placed at least 60 feet from a spot where the sun shines, "or return their policies for cancellation."

"This question of differential rates was taken up by the New England Board of Underwriters, and after some action, was allowed to become inoperative, and the National Board, we are informed, has taken no action beyond having the subject before the meeting, when it was laid on the table for future consideration.

"In conclusion, we wish to inform acetylene interests that the position taken by the insurance interests at this time is not one of antagonistic, but rather a defensive position, and all evidence we can collect goes to show that the safety of acetylene is one of, if not the greatest of important features that demand the manufacturers' attention, and by giving the safety features particular attention he will be assisted by the Consulting Engineers, in more favorable reports; and, at the same time, discourage the unworthy machine and place the acetylene business in the commanding position it now shows evidence of attaining."

New Chicago Lake Shore Station

The Lake Shore and Michigan Southern Railway never does things by halves; it does not indulge in a picayune policy. The best is none too good when it comes to deciding what kind of a road-bed shall be maintained or what kind of an equipment or rolling stock shall be used, and, consequently, it has long since gained the confidence of the traveling public, and has steadily grown in favor because of the liberal policy in the care of its patrons.

The latest evidence of this will be found in the new station which was opened July 12th, in Chicago, and will be known as the La Salle Street Station. The new building extends along Van Buren between La Salle and Sherman Streets. It is the most conveniently located of any passenger station in Chicago, being in the heart of the business district and the only one on the union elevated

loop. All of Chicago's elevated trains stop in front of this station and are connected with it by a covered passageway, so that trains may be taken directly from the second or main floor level without descending to the street.

The main building is thirteen stories high, with a frontage of 213 feet. The train shed is 213 x 575 feet.

The first and second stories are devoted entirely to the requirements of travelers; the floors above these being used for office purposes. At the present time there are nearly two hundred trains entering and leaving this station on week days and a lesser number on Sundays. Descriptive booklet and time table will be sent to any address on application to A. J. Smith, General Passenger and Ticket Agent, Cleveland, O.

Enamel Street Signs the Best

The enamel sign is to-day the cheapest and most durable sign for advertising purposes that there is manufactured, for the reason that it is everlasting, will not fade or tarnish from the effects of the weather and will last a business lifetime. The first cost is the only cost, as when an enamel is once put up, it is there to stay. It is a sign that always catches the eye, and is a silent solicitor for any line of business.

The Burdick Sign Company was the first to manufacture this line of signs. The Company started in business nine years ago. At that time the only enamel signs being sold in this country were manufactured in Europe, imported into this country, and sold at a high price. European companies claimed that enamel signs could not be successfully manufactured in this country, but the success of the Burdick Sign Company, for the past nine years, has demonstrated that they were sadly mistaken, as to-day this Company is putting on the market, one of the finest and best enamel signs that has ever been manufactured, either in this country or in Europe. The Company is interested in, and represent, the only two exclusive enamel sign manufacturers that there are in the United States.

On account of its experience and improved facilities, it is in a

position to-day, in the face of the great advance on all kinds of materials that are used in manufacturing these signs, to put them on the market at a much lower price than was possible nine years ago.

Its trade mark, "B. S. Co., No. 52 State Street, Chicago," can be found on enamel signs that have been distributed all over the United States, from the Atlantic to the Pacific.

Different telegraph and telephone companies in this country are large users of this class of signs, and are always ready to vouch for their merits, attractiveness and durability.

"Huennekes System" Sand-Lime Brick

A RECENT issue of THE MUNICIPAL JOURNAL described bricks made by the Huennekes System." These bricks were used in the construction of the Public School Building shown herewith. The illustration furnishes ample proof of the excellent appearance of buildings constructed with these bricks, as it shows the work not only to have solidity, but a fine finish as well. H. Huennekes and Company, 114 Liberty street, New York, inform the MUNICIPAL JOURNAL AND ENGINEER that, in the United States alone, they have not less than twenty-five factories for the manufacture of these bricks, either in actual operation or in course of construction.

Notes of Interest About the Trade

—The New York office of the Plunger Elevator Company, on September 1, moved from No. 156 Fifth avenue to Room 509, Whitehall Building, 17 Battery place, New York City. This change of quarters was made necessary by the demand for increased office space, and the advisability of a down-town office.

—The Charles Warner Company, Wilmington, Del., has recently started to make three different grades of hydrated products, named: "Limoid No. 60," which is the grade for building and plastering; "Limoid No. 100," which is more finely bolted and especially advantageous for many of the manufacturing industries; "Limoid Superfine," an impalpable powder, finer than the finest ground Portland cement, and an exceedingly pure product. Fuller particulars of this new product can be secured by writing to the company.

—Mr. Stephen Child, landscape architect and consulting engineer, has recently opened an office in the Warren Building, 2A Park street, Boston, Mass.

—The *Courier-Journal*, of Louisville, Ky., announces that the fire department of that city will soon be fitted out with the Gamewell fire alarm telegraph system.

SCHOOL BUILDING, BENNETTSVILLE, S. C.—BUILT OF "HUENNEKES SYSTEM" BRICKS

The Story of Phoebe Snow

IF you have ever taken a summer railroad trip you will enjoy the "Story of Phoebe Snow," which describes in a series of dainty pictures the experiences of a pretty girl who went to Buffalo. The illustrations are in seven colors, each reproducing a design of the girl in white which the Lackawanna Railroad has made so familiar in the last few months. The booklet has a particularly pleasing cover and will afford considerable amusement beside giving information which every traveler ought to know. It will be sent in response to request accompanied by two cents in stamps to T. W. Lee, General Passenger Agent, New York City.

—The product of the East Ohio Sewer Pipe Company, Ironton, Ohio, is of the highest standard of excellence, the goods being produced by the very latest improved machinery in the largest factory in the Ohio valley; this plant has an inexhaustable supply of clay and coal, while its shipping facilities are unexcelled. The plant was built in 1902, and the business has developed so rapidly that the kiln and shop capacity has had to be doubled.

—Mr. William S. Barstow, consulting electrical engineer, has removed his offices to 56 Pine street, New York City, where he will continue to give especial attention to engineering and the development of electrical properties.

Insure Your Meters

EVER since meters came into use, there has been a large percentage of loss, directly chargeable to stealing, whether gas, water or electricity was the product measured. Until quite recently, there has been no device invented to prevent this sort of theft. Not long ago, the Columbus Meter Seal Company, of Columbus, Ohio, placed on the market, a device by which a meter could be locked. Figure 1 shows the seal, or lock, as it may be called, while Figure 2 shows the lock in position on a water meter, so arranged that it is impossible to remove the meter without destroying the lock.

With this lock once in position, it is impossible to tamper with

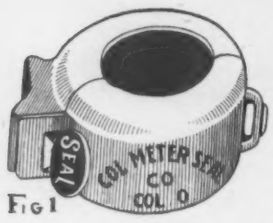


FIG 1

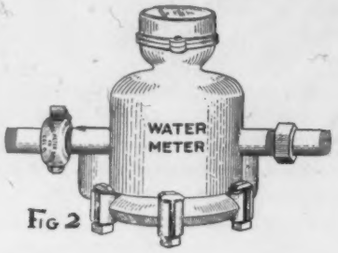


FIG 2

the connection, or loosen the union in any way without breaking the seal. This, of course, would be detected immediately by the meter reader upon his first visit.

The lock is very easily applied, no tools being necessary. The seal is put into position and snapped shut.

To break it requires only a light tap on top of seal.

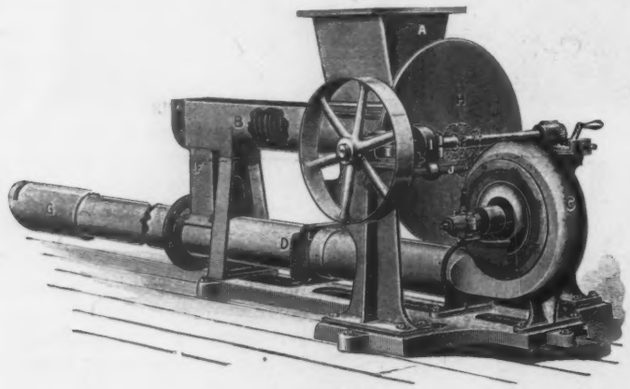
Locks and seals are manufactured to fit water or gas meters and stop cocks, and they are made in all sizes, and adapted to all of the different makes of meters on the market. Jerry O'Shaughnessy, Superintendent of the Water Works, Columbus, Ohio, has this to say of this device: "After thoroughly testing your device for sealing meters, I take pleasure in saying that it is the best lock and seal I have ever seen, and is just what the water companies have needed for years. It is our intention to use one on every meter we have (over 12,000), and I shall take pleasure in recommending them to all interested parties inquiring."

A Coal Dust Burner

THE accompanying illustration shows one of the Rowe coal dust burners, manufactured by the C. O. Bartlett and Snow Company, of Cleveland, Ohio, which is used for feeding dry pulverized coal dust under boilers, in furnaces, brick kilns, lime kilns, smelting furnaces, annealing furnaces and similar places.

It will save at least 80 per cent. in the amount of coal used.

It requires no fireman, makes no clinkers, and absolutely no black smoke *at all*. Its operation is as follows:



The coal dust is fed from storage bin to hopper "A" and is fed along the feed worm "B," drops down spout "F," direct to air spout "D," where it is caught by the air draft and fed into the furnaces, through the opening in cast iron spout "G."

The amount of feed depends upon the speed of the feed worm, which is driven by the friction "I" against the flange plate "H." This friction is moved in or out by the handle so as to get any speed desired, which can be changed at any time by turning the handle. The air is furnished by fan "C," the amount being controlled by valve "E."

Publications Received

—The American Granite Brick Company, incorporated July 7, 1903, has just issued a 12-page booklet with cover. The main office of this concern is located in the Home Life Building, Washington, D. C. The New York office is at 114 Liberty street. It tells of the superior advantages of the "Huennekes' System" for manufacturing sand-lime brick. The new company is capitalized at $950,000, with C. E. Wood as president; John P. Martin, vice-president; John P. Martin, Jr., secretary. The gentlemen just named are three of the five directors; the other two are A. C. McClellan, of Atlantic City, and L. F. Kwiatkowski, 114 Liberty street, New York City.

—The Perfect Sewer Trap Manufacturing Company is sole owner of the Lenhart patents, and the main office of the company is at 61 Beekman street, New York. The 8-page folder recently issued by this concern contains a description and illustration of the Lenhart patent automatic sewer trap valve, besides price-list and testimonials from users of this trap. It deals with a question which is of vital importance to all municipalities and boards of public works, health departments, and these and any others interested in the subject will find useful information in this folder, which can be had upon application.

—Street cleaning superintendents will be interested in the products of the Escoba Manufacturing and Supply Company, 147 Cedar street, New York, which makes a specialty of push brooms, can carriers, street cans, steel scrapers, sprinkling cans, galvanized pails, and, in fact, all street cleaning implements. An illustrated 12-page booklet with cover contains illustrations and price-lists of the goods manufactured by this company.

—The Iron Clad Manufacturing Company, 2, 4 and 6 Cliff street, New York, has issued an attractive 24-page booklet, with cover, descriptive of its extensive line of iron clad galvanized ware. The garbage pails, galvanized garbage cans, galvanized ash cans, engineers' ash cans, galvanized pails, galvanized water pots, galvanized fumigators, and numerous other articles commonly used in the various departments of a municipality, are fully described and illustrated, and prices quoted. It is a booklet that every street cleaning and health department ought to have on file for ready reference.

—"Dragon" Portland Cement is the title of a 76-page booklet, with cover, issued by the Lawrence Cement Company, with offices at No. 1 Broadway, New York, and the Harrison Building, Philadelphia. The cement is manufactured by the Lawrence Cement Company, at Siegfried, Pa. This well-known cement has been in use for thirteen years. The booklet not only contains a lot of interesting information about tests, but about the cement itself, and numerous testimonials from its users.

—The Automatic Electric Company, of Chicago, Ill., has issued a 48-page booklet, descriptive of the automatic telephone. The booklet is handsomely gotten up, and well illustrated. It should be of general interest to municipal officials everywhere.

—The Indianapolis Bridge and Iron Works have issued a 40-page booklet, which is illustrative and descriptive of the various kinds of good roads machinery manufactured by this concern. Street superintendents, city engineers and others concerned with the construction and care of roads and streets will find valuable information in this booklet.

—The New York Continental Jewel Filtration Company has issued an attractive booklet, much space of which is devoted to the East Jersey Water Company's filtration plant at Little Falls, N. J., which was installed a year or so ago and has been working satisfactorily. Most cities are interested in the filtration question and would find some valuable information in this booklet, which can be had by applying to the New York Continental Jewel Filtration Company, New York City.

CONTRACT NEWS FOR THE MONTH

Including Paving, Sewerage, Water Supply, Lighting, Public Buildings, Sewage and Garbage Disposal, Fire Supplies, Contracts Awarded

N. B.—All news of proposed work sent us by city officials is incorporated in our Weekly Advance News Service and appears subsequently in this "Contract News for the Month" if the date of the reception of bids be sufficiently late to warrant placing the item here.

City officials and others are urged to send us all news of contemplated improvements for use in our Weekly Bulletins which are mailed to those interested.

PAVING, PAVING MATERIALS AND MACHINERY

Ada, O.—Will issue $54,000 bonds for brick paving.

Albany, N. Y.—It was stated that Lawrence street would be extended.

Alexandria Bay, N. Y.—Reports state that it is proposed to build a boulevard of 40 miles along St. Lawrence avenue at Thousand Islands Park.

Athens, Ga.—Clarke county voted to issue $100,000 bonds for roads.

Austin, Tex.—Talking of a three and one-half mile road to Camp Mabry.

Bakersfield, Cal.—It was stated that I street was to be paved.

Bethlehem, Conn.—Reports stated that $2,000 was available for road work.

Bluffton, Ind.—It was voted to build 42 miles of gravel road in Jackson township. In the city ten blocks will be paved.

Boston, Mass.—The Metropolitan Park Commission will ask for bids for extending the Revere Beach parkway.

Cambridge, Mass.—The cost of improving the streets as recommended by Street Commissioner Shea, is placed at $169,000.

Chattanooga, Tenn.—The Board of Public Works has asked for $25,000 for improving the streets.

Chicopee, Mass.—The State highway in Chicopee street is to be extended. State Highway Commissioners.

Chippewa Falls, Wis.—It was stated that $18,000 was to have been spent on street improvements.

Cleveland, O.—A number of streets are to be paved with brick. City Clerk Witt.

Clinton, Tenn.—Anderson county will issue $100,000 bonds for good roads. County Clerk.

Columbus, O.—It was stated that bids will be asked for improving Sherman, 9th, 10th, Lexington and Garfield avenues and four streets. Board Public Service.

Crawfordsville, Ind.—It is stated that cement walks are to be laid. City Clerk Hulett.

Damascus, O.—Considerable grading is to be done by Columbia County Commissioners, Lisbon.

Dayton, O.—Ordinances call for the improvements of several streets. City Clerk Floyd.

Evanston, Ill.—It was reported that macadam paving was to be planned.

Fayette, N. Y.—Residents have been talking of a highway.

Ft. Wayne, Ind.—Plans for paving have been approved. City Engineer Randall.

Frederick, Md.—Market street is to be paved.

Gainesville, Ala.—It was voted to issue $120,000 bonds for roads in Sumter county. E. N. Kling.

Galesburg, Ill.—Some Purington brick may be laid, according to reports. City Engineer Connolly.

Galveston, Tex.—The streets in bad condition are to be repaired. Board City Commissioners.

Greenville, Miss.—Bids are wanted October 6 for 30,000 square yards of brick paving on concrete and 10,000 feet of stone curbing. City Clerk Yerger.

Greenville, O.—Bids were asked on September 24 for $66,500 road bonds. County Commissioners.

Hamilton, O.—Resolutions were passed recently to improve Ross and Butler avenues and So. D and Franklin streets. Mayor C. S. Bosch.

Hickory, N. C.—This place will vote, October 12, on the issue of $10,000 bonds for the improvement of streets. The Mayor.

Houston, Tex.—May remove asphalt and lay brick on three streets aggregating 11,000 square wards. Will issue $300,000 bonds for street paving. Planning the paving of Liberty avenue and two other streets. City Engineer Dormant.

Huntsville, Ala.—Madison county may issue $100,000 bonds for roads.

Indianapolis, Ind.—Will issue $100,000 bonds for a boulevard.

Ironton, O.—Will issue $25,000 bonds for street improvements.

Jefferson City, Mo.—Will lay 15,000 square yards of macadam, 10,000 feet of curb and 37,000 square feet of granitoid walk. City Engr. J. C. Herring.

Lake Charles, La.—Bids were to be asked for brick or asphalt on Ryan street. City Engineer Boren.

Lemars, Ia.—May lay brick on several streets.

Lenox, Mass.—May lay $20,000 worth of macadam on Depot street.

Long Branch, N. J.—The Board of Freeholders have been asked to build a macadam road to Red Bank at a cost of $75,000.

Menominee, Mich.—Will plan for brick and macadam paving on Grand avenue and other streets. City Engineer.

Mexico, Mo.—Ordinances have been before the council calling for the paving of Monroe and Jackson streets.

Moline, Ill.—Will lay brick on 11th avenue, 8th, 11th streets, and asphalt on 11th avenue and 8th street.

Morrison, Ill.—It was stated that Main street would be paved at a cost of $16,500.

Oakland, Cal.—Surveys have been made for a 14 mile boulevard that is to cost $225,000. County Surveyor Prather. Market street will be re macadamized. City Clerk Thompson.

Paducah, Ky.—A vote will be taken in November on $60,000 bonds for paving. The Mayor.

Peoria, Ill.—Smith street may be paved with brick. City Engineer.

Philadelphia, Pa.—A loan of $8,000,000 has been proposed, of which amount $200,000 is to be used for repairs to streets and other items for resurfacing streets. Congress will be asked to provide $122,000 for paving at League Island Navy Yard.

Pleasanton, Tex.—A vote was taken on September 19 on $50,000 bonds for improving the streets. County Judge.

Portsmouth, O.—Bids are wanted October the 10th for paving on three streets. City Auditor Musser.

St. Johns, Que.—It was voted to issue $32,000 for streets and walks.

San Antonio, Tex.—Bids are wanted October 10th for $500,000 worth of gravel roads in Bexar county. Robert B. Green, County Judge, has plans.

Sandusky, O.—Planning to pave Washington Row. Board Public Service. $75,000 have been appropriated for streets.

San Marcos, Tex.—Will issue $70,000 worth of street bonds. Judge E. R. Kone.

Santa Barbara, Cal.—$50,000 bonds will be issued for a boulevard.

Superior, Wis.—Macadam roads will probably be ordered by the County Board.

Tamaqua, Pa.—A vote will be taken on November 3 on $42,000 bonds for paving streets.

Toledo, O.—It was stated recently that the County Commissioners wanted a ten ton road roller.

Winston, N. C.—It was voted to issue $100,000 bonds for improving streets, water works and sewers.

Winton Place, O.—Bids are wanted October 6th for $3,000 street bonds. Village Clerk Dittoe.

Youngstown, O.—Grant street may be paved as asked in a petition; also Wick avenue.

Contracts Awarded

Adams, Mass.—The contract for paving Myrtle avenue was let the Flint Granite Company of Monson.

Alliance, O.—The contract was let for Garfield brick on E. Palestine street to John C. Devine at $30,000.

Astoria, Ore.—Contracts for brick paving and walks let to W. A. Gooding at $12,994.

Bayonne, N. J.—Contract awarded to Henry Byrnes, Jersey City, for improving Avenue A, West 20th street, etc.

Belvidere, Ill.—The Federal Asphalt Company, of Chicago, has received the contract for paving State street.

Berkeley, Cal.—The contract for improving Virginia street was let to Hutchinson Company at 48 cts. a cu. yd. for grading, 6¾ cts. square foot for macadam, 13½ cts. sq. ft. for 4 foot concrete gutters.

Birmingham, Ala.—The Birmingham Contracting Company has received a contract for macadamizing at $13,400.

Boston, Mass.—Contracts for sections of the state highways let Fred E. Ellis, Melrose, and Wm. N. Flynt Granite Company, Monson.

Canandaigua, N. Y.—Contract let Chamber & Grady, Rochester, for Mack brick on several streets.

Canonsburg, Pa.—Contract let to Peabody & Filbert, Pittsburg, for 2,500 feet of paving on E. College street at $10,373.

Connersville, Ind.—Contract let Thos. Bridge's Sons, Wabash, for brick paving at $1.48 sq. yd.

Dayton, O.—Contract for repairing asphalt streets let Kircher Construction Company of Cincinnati, at $16,075.98. Contract let Wm. J. Kernan Company for repairing paving on Wayne avenue at $2,649.

Decatur, Ind.—Contracts for macadam roads let Davis Dailey and E. Woods & Co. Contract for brick paving on three streets let to H. P. Striker, Toledo, O., at $1.75 sq. yd.

Delray, Mich.—Contract for paving Michigan avenue let Julius Porath at $45,000.

E. Palestine, O.—Contract for paving Market street let J. C. Devine, Alliance, at $30,000.

Elwood, Ind.—Contract for walks on So. K street let P. T. O'Brien; on other streets to M. L. Bolin, Tipton.

Franklin, Ind.—Contract for Brazil block let Capital Paving & Constr. Co., Indianapolis.

Freeport, Ill.—Contract let William Ascher for macadamizing Douglas

avenue at 28 cts. for cement curb, 30 cts. for macadam and 30 cts. for excavation.

Greencastle, Ind.—Contract for 18 miles of road in Russell township let Schriber & Hodgkin, Russellville.

Independence, Kan.—Contract let Likes Bros., Des Moines, for 40,000 sq. ft. of brick paving at $1.46.

Independence, Mo.—Contracts let to Chas. Yetter for brick on E. Lexington street at $1.70 sq. yd. and to Wm. Randall for brick on E. Maple avenue at $1.70.

La Salle, Ill.—Contract was let to John Cherry, Jacksonville, for paving on St. Vincent's avenue at $40,000.

Marion, Ind.—Contract for Metropolitan block on 10th street was let to W. W. Hatch & Son at $8.57½ per lin. ft.

Middletown, Conn.—Contract for macadamizing on the South Farms road was let to McDonald & Hennessey.

Milbury, Mass.—A contract for part of the state road was let to Hill Bros. at $7,000.

Millville, N. J.—Contract was let to A. J. Lupton, Bridgeton, for county road building.

Milwaukee, Wis.—R. J. Hickey received a contract for granite block on Commerce street. The Badger Construction Company received the contract for 11,240 sq. yds. of brick on 3d street, for 4,327 sq. yds. on Wells street at $2.09, and for 2,066 sq. yds. on Virginia street at $2.07 sq. yd.

Montgomery, Ala.—The contract for walks on two streets was let to Hannon & Hodgson at $24,400.

New Brunswick, N. J.—J. M. Hurley, Trenton, received the contract for roads No. 2 and 3 and, Rue & Fountain, Old Bridge, for road No. 1.

New Hartford, Conn.—Contract for gravel roads let to A. Brazos & Sons, Middletown.

Newport, R. I.—Contract for granolithic walks at Ft. Rodman let to P. B. Elkins Company, 8 Beacon street, Boston.

Newton, Conn.—C. W. Tyson received contract for 4,087 feet of gravel road at 72 cts. per lin, ft.

Paducah, Ky.—E. C. Terrell has the contract for seven blocks in the business section at $40,000.

Pasadena, Cal.—Contract for 1½ miles of paving on South Orange Grove let to Andrew Holloway at $31,000.

Paxton, Ill.—H. R. Palmer, of Danville, received a contract for 22,000 sq. yds. of brick on gravel at $1.20 sq. yd., and 13,000 feet of cement curb at 57 cts.

Pittsburg, Pa.—Contract let to Booth & Flinn for re-asphalting Homestead avenue, etc.

Portsmouth, R. I.—Contract for 3,000 feet of state road let of J. C. Peckham, Middletown, at $2,846.

Reynoldsville, Pa.—Contract for laying brick on 4th street let to Chas. B. Hastings, Brookville.

Rochester, N. Y.—Contract let F. A. Brotsch for brick paving on Caroline street.

Rock Island, Ill.—Contract awarded the Tri-City Construction Company, Davenport, for brick on 17th street at $1.38 a sq. yd.

Rome, N. Y.—Contract let to L. W. Eddy for Syracuse brick on E. Dominick street.

St. George, N. Y.—Contract for asphalt block on Richmond Terrace let to J. E. Donovan.

Schenectady, N. Y.—Contract for asphalt paving on several streets let Schenectady Construction Company at $2.20 sq. yd.

Seattle, Wash.—Contract for granite walks let William Stanley & Company, C. J. Erickson, J. A. Bailey, Ryan & Co., and J. Kalberg.

Sidney, O.—Contract let to Jas. E. Conley, Dayton, for 48,880 sq. yds. Metropolitan block on concrete and gravel at $102,717.

Springfield, Mass.—Contract for sections of state highways let to Olin T. Benedict, Pittsfield. Contract let J. W. Weeks, Jr., for widening Worcester St.

Sterrett, Pa.—Contract let to Booth & Flinn, Pittsburg, for paving Franks-town avenue.

Sullivan, Ind.—Contract for one mile of stone road let to Satathiel Boone of Haddon.

Summitville, Ind.—Contract let to C. J. Daniels, Anderson, for 15,000 sq. yds. of paving at $2 and for 42,000 sq. ft. cement walk at 14 cts. sq. ft.

Sycamore, Ill.—Contract let the Federal Asphalt Company, Chicago, for asphalting on State street.

Taylorville, Ill.—Contract let to P. H. Hunt & Co., Decatur, for 55,000 sq. yds. brick paving on 6-in. concrete, at $1.47 sq. yd., and at 53 cts. per foot for curb.

Thompsonville, Mass.—Contract let Amos D. Bridge, Hazardville, for macadam on Prospect and Tariff streets.

Troy, N. Y.—Contract for Mack brick on Pawling avenue let to P. Kavanaugh at $16,834.

Waseca, Minn.—Contract let the Likes Improvement Co., Des Moines, Ia., for brick on 2d street.

Watertown, N. Y.—Contract for four miles of road let to W. A. Burnham, Glen Falls.

WATER SUPPLY

Alfred, N. Y.—Voted $12,000 bonds additional for water works.

Ashland, Pa.—It will cost about $10,000 to secure good water.

Atlanta, Ga.—May lay $30,000 worth of new pipe.

Atlantic City, N. J.—Bids, Oct. 2nd, for 42 in. wood conduit. Board of Water Commissioners.

Barberton, O.—The cost of water works and pumping station is placed at $75,000. Village Engineer Collins.

Bemidji, Minn.—May sink a well for an increased supply.

Big Timber, Mont.—Plans for water works are being made. County Surveyor Walford.

Bisbee, Ariz.—Will probably install $200,000 water works. City Clerk Kinsey.

Bishop, Cal.—Is talking of installing water works.

Blasdell, N. Y.—Has voted $30,000 bonds for water works.

Bloomington, Ind.—May issue $10,000 bonds for water mains.

Bordentown, N. J.—Plans are to be made for water works. City Clerk Kunzie.

Boulder, Colo.—The council may spend $100,000 on an irrigation scheme.

Bristol, S. D.—Plans are ready for water works.

Burkes Falls, Ont.—Will put in $30,000 water works. Town Clerk Bazett.

Calgary, Alberta.—Bids. Oct. 1st, for water tower and tank. City Engineer F. W. Thorold.

Canton, O.—Will place new pumps in West 3rd Street Station. City Clerk Zellers.

Cheney, Wash.—Will buy the works of the Cheney Water Co., and improve the same. The Mayor.

Chicago, Ill.—Will build a $40,000 pumping station on 68th street next fall. Board of Local Improvements.

Cincinnati, O.—There still remain $2,000,000 worth of contracts to be let in the fall. Pres't, Water Works Commissioners.

Clark, S. D.—Is contemplating installing water works.

Colorado City, Colo.—It will cost $60,299 to build reservoirs.

Coopersburg, Pa.—Have sold $19,999 bonds for water works.

Corsicana, Tex.—A committee will ascertain the cost of city water works. The Mayor.

Covington, O.—Has voted $30,000 bonds for water works.

Denison, Tex.—The city may install water works. The Mayor.

De Soto, Mo.—Will vote on bonds for city water works. Mayor Slawson.

Dover, O.—May spend $3,000 on improving the water works.

Downing, Wis.—Is contemplating building water works.

Eagle Lake, Tex.—Is talking of building municipal water works.

E. Connersville, Ind.—May install water works to cost $10,000. Town Board.

Ecarse, Mich.—May erect water works.

Elba, Ala.—Will issue $15,000 bonds for water works.

Elkhorn, Ky.—Will issue $20,000 bonds for water works and schools.

Ellisville, Miss.—Has voted $20,000 bonds for water works. Town Clerk Parker.

Ely, Minn.—The cost of water works for this place is estimated at $18,000.

England, Ark.—Will install water works. T. J. Hudson.

Fargo, N. D.—May install a meter system.

Flint, Mich.—Will vote Nov. 1st instead of Sept. 1st on water works.

Florence, Ala.—The Water Commissioners may buy 200 meters.

Fortuna, Cal.—The cost of water works is placed at $12,355 by the County Surveyor Connors.

Franklin, Tenn.—Will vote Sept. 30 on bonds for water works.

Garfield, N. J.—Has voted for a municipal water works plant. Boro. Att'y Sullivan.

Genesee, Idaho.—Has voted $16,000 bonds for water works.

Gloucester, Mass.—May extend its mains to Lanesville.

Gloucester, N. J.—Has voted $16,000 bonds for a mechanical water filtration plant.

Grafton, Wis.—Plans for new water works will be made by Jacob Cloos, Milwaukee.

Great Barrington, Mass.—An engineer will estimate the cost of water works for the town.

Halstead, Minn.—May vote on $16,000 bonds for water works.

Hickory, N. C.—Will vote, Oct. 12th, on $60,000 bonds for water works. The Mayor.

Holton, Kan.—May build water works and sewers to cost $50,000.

Houghton, Mich.—Has voted $100,000 bonds for improving the water works. Village Clerk Brand.

Hyde Park, Vt.—It will cost $12,000 to put in water works.

Jackson, Minn.—Will put up a new tower and lay 10,000 ft. of mains.

Jackson, N. H.—A. W. Dudley, of Manchester, will plan the water works.

Knox, Ind.—Is talking seriously of installing water works.

Lafayette, Ala.—May extend its water works. Town Clerk.

Lansing, Ia.—Will build $20,000 gravity water works.

Lennox, S. D.—Has voted $10,000 water works bonds.

Lewiston, Mont.—Bids, Sept. 30th, for $10,000 water works bonds. City Clerk Pfaus.

Lewistown, Pa.—Plans for gravity water works are being prepared. City Clerk Settle.

Lockport, N. Y.—Fire and Water Committee will sink test wells for a proposed supply.

Lynchburg, Va.—Will buy a site for dam and water works.

McKeesport, Pa.—The Council is considering an ordinance for installing a filter, etc. Supt. of Water Works Verner.

Magnolia, Miss.—Will vote, Oct. 6, on $25,000 bonds for water works. The Mayor.

Mankato, Minn.—Will ascertain the cost of water works for East Mankato. Board of Public Works.

Medina, N. Y.—If the test wells are successful, a gravity system will be installed.

Menasha, Wis.—Will ask plans for water works. Address S. S. Little, City Clerk.

Merced, Cal.—Has voted against bonds for water works and a lighting plant.

Mercersburg, Pa.—Is talking of installing municipal water works.

Miamisburg, O.—Will soon vote on bonds for a municipal water works.

Middletown, O.—It will cost $25,000 to place the water works in good condition.

Missoula, Mont.—Is contemplating installing water works.

Monroe, Ga.—Has voted against bonds for water works. Mayor Walker.

Montreal, Que.—The council will consider the filtration of the city's water.

Morganton, N. C.—The franchise for the water works is let to H. L. Millner.

Morganton, Ky.—The franchise for the water works and electric lights is let to J. M. Carson.

Montreal, Can.—Superintendent of the Water Works, Janin, wants $200,000 for cementing the floors of the reservoirs.

Nevada, Mo.—Will plan a water works plant. R. E. McDonnell, Kansas City.

New York, N. Y.—Larger mains are wanted in Brooklyn's streets by Commissioner Munroe.

Oberlin, O.—Plans for a filtration and softening plant for the water works has been approved by the State Health Board.

Oswego, N. Y.—Plans for $25,000 water works for the East Side were made by City Engineer Ormsby.

Parkersburg, W. Va.—Is planning for the purification of the water supply. City Engineer Dunbar.

Pittsburg, Pa.—An estimate is to be made for filtration. Director of Public Works.

Portsmouth, O.—May put in new intake pipe.

Ridgeway, S. C.—May build water works. The Intendent.

San Bernardino, Cal.—The water system is to be extended and steel mains laid.

San Diego, Cal.—Will probably buy 16,000 ft. of 6 in. pipe. City Engineer.

Santa Fe, N. M.—The United States Government will build a $100,000 irrigation system on Zuni Indian Reservation.

Sapulpa, Ind. Ter.—The city will build water works. Mayor I. C. Perkins.

Sansalito, Cal.—Is investigating a water supply for the town. Board of Trustees.

Sheboygan, Wis.—On Oct. 1st, the plans for the water works will be accepted. Board of Public Works.

Shelton, Neb.—Has voted to issue bonds for water works to cost $12,500.

Springfield, Ill.—Will sink test wells to locate an increased water supply.

Springfield, O.—Will increase the water supply.

Spokane, Wash.—Is planning to dig a large well to augment the water supply.

Staatsburg, N. Y.—A committee is considering the question of a standpipe for fire protection. Geo. W. Kidder.

Stillwater, Minn.—Is talking of building municipal water works.

Sullivan, Ind.—A franchise for water works has been asked for by John C. Cheney.

Sulphur Springs, Tex.—Will extend the water works.

Tahlequah, Ind. Ter.—A franchise for water works has been let to Ress Bros., Fayetteville, Ark.

Thief River Falls, Minn.—May build water works.

Waco, Tex.—Has voted $500,000 for water works. The Mayor.

Warroad, Minn.—May build water works and lighting plant.

Washington, D. C.—Is surveying for national irrigation work for which $15,000,000 is available.

Waterville, N. J.—Petition asks for water works and sewers.

Waubay, S. D.—Plans for $10,000 water works are being made by Prof. J. J. Flather, of Minneapolis, Minn.

Welcome, Minn.—Has voted $9,000 for water works.

Wellington, O.—Will spend $10,000 on improvements.

W. Milton, O.—Has voted $6,000 bonds for water works.

W. Palm Beach, Fla.—The local water company may extend its mains.

Whitecastle, La.—Will issue $80,000 bonds for water works. The Mayor.

Winston, N. C.—Has voted $100,000 bonds to improve the water works and sewers.

Wrentham, Mass.—Is considering the installing of water works.

Yutan, Neb.—Has voted $5,000 for water works.

Contracts Awarded

Beardsley, Minn.—The contract has been let to W. D. Lovell, Minneapolis, for extending the water mains.

Bedford, Ind.—Contract has been let to D. Y. Johnson for a filtering well.

Candor, N. Y.—Contract has been let to Mr. Firby, Greene, for water works for the village—to cost $23,000.

Clinton, Ill.—Contract has been let to the Chicago Bridge & Iron Co. for a steel tower and tank at $3,294.

Coopersville, Mich.—The contract for the water works has been let to A. L. Maltby, Chicago.

Dundee, Ill.—The contract for water works has been let to William Tenney, Joliet.

East Branch, N. Y.—A contract for 3,500 ft. of pipe, etc., for the water works has been let to S. N. Wheeler & Son.

Ellendale, Minn.—Contract has been let to the National Construction Co., South Bend, Ind., for the water works.

Ft. Barrancas, Fla.—The contract for the water works has been let to Frank Satter, Pensacola, at $26,350.

(Continued on page 28.)

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Municipal Journal Publishing Co.
253 BROADWAY NEW YORK

Ft. Collins, Colo.—Contract has been let to Holme & Allen Pipe and Construction Co., Denver, for water works.

Grand Rapids, Mich.—The lowest bid for laying mains was from D. W. Boyes, 275 Stocking street.

Ithaca, N. Y.—Contract for 5,000 ft. 12 in. c. i. pipe has been let to Thomas O'Dea, Cohoes, at 50 cts. per ft.

Johnson City, Tex.—Luke Low Paving Co., Bristol, has the contract for the reservoir for Johnson City Water Co.

Long Island City, N. Y.—Contract for 3½ miles of 6 to 16 in. pipe and 105 hydrants has been let to Clinton Beckwith, Herkimer, N. Y., at $51,489.

Milan, Minn.—The contract for water works has been let to W. D. Lovell, Des Moines, Ia., at $5,564.

Reno, Nev.—The contract for an irrigating canal has been let to Charles A. Warren & Co., San Francisco., at $942,337.

Richmond, Mo.—Contract has been let to W. Kinsted, Liberty, for $20,000 water works.

Roselyn, Wash.—The contract for laying water mains has been let to P. P. Lumsden.

Schenectady, N. Y.—Contract has been let to the Schenectady Railway Co. for electric apparatus for greatly enlarged water works.

Seattle, Wash.—The contract for laying mains on 20th avenue has been let to Frank & Brandon, at $9,430.

Shippensburg, Pa.—Contract has been let to Jno. Hasfeld for a 2,000,000 gallon reservoir at $14,985.

Washington, D. C.—The contract for completing a filtration plant has been let to the Sand Filtration Co., of America.

Wayland, N. Y.—Contract has been let to Martin L. Brown, Owego, for water works, at $22,475.

Yazoo City, Miss.—Contracts for the city water works have been let to the Dimmick Pipe Co., Birmingham, Ala., for pipes; R. D. Wood & Co. for hydrants; pumps, etc., to Henry R. Worthington, New York; boilers to Henry Vogt Machine Works, Louisville, Ky.

PUBLIC BUILDINGS

Ada, Minn.—Has voted $25,000 bonds for a school.

Ashland, Wis.—An $85,000 school will be erected. Board of Education.

Belvidere, Ill.—$25,000 has been given towards a library.

Berkeley, Cal.—Plans have been accepted for a $36,000 Carnegie library.

Butte, Mont.—Bids, Oct. 5, for conduit and electric wiring system in United States Post Office. J. K. Taylor, Treas. Dept., Washington, D. C.

Cass Lake, Minn.—Will erect a $20,000 school.

Centralia, Ill.—Plans for a $40,000 high school have been made by Charles W. Rapp, 100 Washington St., Chicago.

Chattanooga, Tenn.—Plans for a Carnegie library have been accepted. Hunt, Adams & Bearden, Architects.

Dawson, Ga.—Has voted $20,000 bonds for a school. City Clerk Bell.

Dothan, Ala.—Bids, Nov. 2, for a courthouse and jail. Judge George Leslie.

E. Alton, Ill.—Plans for a school are to be made by F. Oswald, Alhambra.

Flint, Mich.—The new poct office will cost $55,900.

Ft. Wayne, Ind.—City Clerk A. M. Schmidt writes that the city is contemplating the construction of an electric lighting plant to supply 600 to 800 arcs and 35,000 to 50,000 incandescents. Engineers and contractors are requested to write him.

Ft. William, Ont.—Will build a $240,000 town hall.

Gainesville, Ga.—A county prison has been recommended.

Greeley, Colo.—Will add to the Normal School at a cost of $58,000.

Guthrie, Ok. Ter.—Will build a $50,000 high school.

Hannibal, Mo.—Plans for a $25,000 high school have been made by Haynes & Burnett.

Harrisburg, Ill.—Is talking of building a new court house.

Hartford, Conn.—It talking of building a new city hall.

Hartford City, Ind.—Has voted to build a $40,000 school.

Hazleton, Pa.—Has about decided on a site for the city hall.

Herkimer, N. Y.—Petition asks for a $30,000 municipal building.

Hickory, N. C.—Will vote, Oct. 12, on bonds for a city jail. The Mayor.

Hillsboro, Tex.—Will erect an $8,500 school. The Mayor.

Houston, Tex.—Bids, Oct. 1, for $100,000 bonds for completing market, central fire station and schools.

Irvington, N. J.—Will spend $21,000 on a school. Board of Education.

Jackson, Minn.—Plans, Sept. 30, for $60,000 court house. County Auditor McKellar.

Livingston, Mont.—Plans for a library have been accepted. A. W. Bell, Architect, Helena.

Los Angeles, Cal.—May not issue the $400,000 bonds for storm drains, but vote bonds for library and jail.

Madison, Wis.—Will erect a $200,000 school. Board of Education.

Manchester, N. H.—The site for the new $45,000 court house has been selected. Commissioner Bickford.

Marion, Ind.—$260,000 is to be spent on a new court house. County Commissioners.

Marquette, Mich.—Will issue $50,000 bonds for a city hall.

Marshall, Tex.—Will erect a $30,000 school. The Mayor.

Meridian, Miss.—Plans for a $100,000 court house have been accepted. County Court.

Michigan City, Ind.—Is considering a $50,000 city hall.

New Castle, Ind.—The County Commissioners want to build a $48,000 addition to the court house.

(Continued on page 29.)

The Best Books on Municipal Subjects

TREATISE ON HYDRAULIC AND WATER-SUPPLY ENGINEERING. Practical construction of waterworks in America. J. T. Fanning. Illus., 650 pp. $5.00. v.

PRACTICAL TREATISE ON THE CONSTRUCTION OF ROADS, STREETS AND PAVEMENTS. Gen. Q. A. Gillmore. Illus. $2.00. v.

PURIFICATION OF PUBLIC WATER SUPPLIES. John W. Hill. 304 pp., illus. $3.00. v.

PORTLAND CEMENT. Its manufacture and use. Charles D. Jameson. $1.50. v.

REPORT ON THE FILTRATION OF RIVER WATERS FOR THE SUPPLY OF CITIES IN EUROPE. James P. Kirkwood. Illus. $7.50. v.

WATER-WORKS DISTRIBUTION. A guide to the laying out of distribution mains for cities and towns. J. A. McPherson. Illus. $2.50. v.

SEWAGE DISPOSAL IN THE UNITED STATES. G. W. Rafter and M. N. Baker. Illus. $6.00. v.

SEWAGE TREATMENT, PURIFICATION AND UTILIZATION. J. W. Slater. (English.) $2.25. v.

SEPARATE SYSTEM OF SEWERAGE. Theory and construction. Cady Staley and G. S. Pierson. Illus. $3.00. v.

NEW ROADS AND ROAD LAWS IN THE UNITED STATES. Gen. Roy Stone. Illus. $1.00. v.

PRACTICAL TREATISE ON THE EXAMINATION OF MILK, CREAM, BUTTER, ETC. J. A. Wanklyn. $1.00. v.

WATER ANALYSIS. Treatise on the examination of potable water. J. A. Wanklyn. $5.00. v.

SEWERAGE AND LAND DRAINAGE. Geo. E. Waring, Jr. Illus. $6.00. v.

MODERN METHODS OF SEWAGE DISPOSAL FOR TOWNS, PUBLIC INSTITUTIONS AND HOUSES. Geo. E. Waring, Jr. Illus., 260 pp. $2.00. v.

DESIGN AND CONSTRUCTION OF STORAGE RESERVOIRS. Arthur Jacob. 50 cents. v.

WATER AND WATER-SUPPLY. W. H. Corfield. (English.) 50 cents. v.

SEWERAGE AND SEWAGE PURIFICATION. M. N. Baker. 50 cents. v.

POTABLE WATER AND METHODS OF DETECTING IMPURITIES. M. N. Baker. 50 cents. v.

WATER METERS. Comparative tests of accuracy, delivery, etc. Ross E. Browne. 50 cents. v.

FLOW OF WATER IN OPEN CHANNELS, PIPES, SEWERS, ETC. (With tables.) P. J. Flynn. 50 cents. v.

THE TREATMENT OF SEWAGE. Dr. C. Meynott Tidy. 50 cents. v.

ART OF ILLUMINATION. How to properly distribute artificial light. Louis Bell, Ph.D. 350 pp, illus. $2.50. m.

WATER-WORKS FOR SMALL CITIES AND TOWNS. John Goodell. 281 pp., illus. $2.00. m.

SOME DETAILS OF WATER-WORKS CONSTRUCTION. W. R. Billings. 96 pp., illus. $2.00. m.

WATER TOWER, PUMPING AND POWER STATION DESIGNS. Illus. $2.00. m.

WATER WASTE PREVENTION. Its importance and the evils due to its neglect. Henry C. Meyer. $1.00. m.

ELEMENTS OF SANITARY ENGINEERING. Mansfield Merrimman. 222 pp. $2.00. w.

RESERVOIRS FOR IRRIGATION, WATER-POWER, AND DOMESTIC WATER-SUPPLY. Also an account of various kinds of dams and their construction. James D. Schuyler. 432 pp., illus. $5.00. w.

MUNICIPAL YEAR BOOK. M. N. Baker. 350 pp. $3.00. e.

COST OF LAYING WATER PIPE. C. D. Barstow.

AMERICANS IN PROGRESS. A story of settlement work in Boston. Robert A. Woods. 383 pp. $1.50 net. h.

SEE ALSO OTHER LISTS IN THESE PAGES

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Newport News, Va.—Bids, Oct. 7, for conduit and wiring system in the United States post office. J. K. Taylor, Treas. Dept., Washington, D. C.

New York, N. Y.—New bids are to be asked for school No. 150, Manhattan, and No. 37 in the Bronx.

Nogales, Ariz.—Congress will be asked to authorize a government building here.

Northington, Mass.—New bids are wanted when the plans of the library are changed.

Oakland, Cal.—May issue bonds for $50,000 for a Polytechnic High School.

Palo Alto, Cal.—Plans for Carnegie library have been made by Dodge & Dolliver, San Francisco.

Port Arthur, Tex.—Will vote on $35,000 bonds for a city hall. The Mayor.

Portland, Me.—Is considering a site for the proposed court house. County Commissioners.

Reading, Pa.—Plans for a boys' high school are being considered. Cost to be $225,000. School Board.

Santa Fe, N. M.—Will build $75,000 school at Zuni Indian Reservation.

Savannah, Ga.—Bids, about Oct. 15, for a city hall. The Mayor.

Seattle, Wash.—Will vote on $500,000 bonds for a city hall.

Seattle, Wash.—Plans for Carnegie library have been accepted. P. J. Webber, Fisher Bldg., Chicago.

Terre Haute, Ind.—Will erect a manual training school. Trustees, State Normal School.

Two Rivers, Wis.—Has voted $441,000 bonds for a school. City Clerk.

Valparaiso, Ind.—Will vote on a $50,000 high school.

Weatherford, Tex.—A petition asks for a new jail.

Webster, Mass.—Is planning a $60,000 high school.

Youngstown, O.—Mayor Gibson declares a new city prison is necessary.

Contracts Awarded

Baker City, Ore.—Contract has been let to Neuhaus Bros. for a city hall.

Boyonne, N. J.—Contract has been let to Hodgson Bros., New York, for a $50,000 Carnegie library.

Beaumont, Tex.—The contract for the high school has been let to E. Nelson at $57,861.

Cape Girardeau, Mo.—The contract for the Normal School has been let to Regenhardt & Moule at $175,000.

Clarendon, Tex.—The contract for the county jail has been let to Jno. A. White, Vernon.

Corunna, Mich.—The contract for the court house has been let to George Rickman & Sons Co., at $78,600.

Danbury, N. C.—The contract for Stokes County court house has been let to L. W. Cooper, Charlotte, N. C., at $20,000.

Greenville, S. C.—Contract has been let to J. R. Lawrence for additions to the Central and two other schools.

Grinnell, Ia.—The contract for the high school has been let to R. G. Coutts at $30,500.

Hackensack, N. J.—The contract for the addition to the Union Street school has been let to George Collins, at $15,477.

Indianapolis, Ind.—The contract has been let to George Weaver & Son, 1409 Steele St., for a school on Ritter Ave., at $30,000.

Italy, Tex.—Contract for a school has been let to D. Mahoney, Waxahachie, at $9,528.

Jersey City, N. J.—The contract for School No. 11 has been let to M. T. Connolly Contracting Co., at $66,999.

Kalispell, Mont.—A city hall will be erected by Nicholas Washbush at $11,847.

Kansas City, Kan.—The contract for a school on Wood street has been let to F. A. Thompson at $16,450. Board of Education.

Kirksville, Mo.—The contract for the Federal Buildling has been let to the Stafford Construction Co., St. Louis.

Lawrence, Mass.—The contract for a public building has been let to Richardson & Burgess, Washington, D. C., at $84,432.

Lewiston, Idaho.—The contract for the central school has been let to H. T. Madgwick, at $35,500.

Manistee, Mich.—The contract for the Carnegie library has been let to Nelson & Hansen, at $33,176.

New York, N. Y.—Contracts have been let to Carrere & Hastings, 28 E. 41st St., for a ferry terminal at St. George, and to Schnelling & Patter for the Stapleton terminal.

No. Tonawanda, N. Y.—The contract for the Carnegie library has been let to William Allen, at $18,000.

Portland, Ore.—Contract has been let to Langford & Walker for an addition to the court house, at $140,000.

Russellville, Ky.—Contract has been let to E. W. Furey, Newport News, Va., for completing the Logan County court house.

St. Paul, Minn.—Contract has been let to Lauer Bros. for an armory at $60,000.

Summit, Utah.—The contract for the county court house has been let to E. J. Bates and John Salmon, of Coalsville.

Two Rivers, Wis.—Contract for a school has been let to Frank L. Wolfe, at $43,393.

Vancouver Barracks, Wash.—The contract for a hospital has been let to Lister & Scott, at $53,973. F. H. Hathaway.

Virginia, Minn.—The contract for a $60,000 high school has been let to John Donlin, Superior, Wis.

Washington, D. C.—The contract has been let to Burgess & Parsons for the William Ludlow School, at $40,719.

(Continued on page 31.)

The Best Books on Municipal Subjects

WATER-SUPPLY. Considered from a sanitary standpoint. Wm. P. Mason. 500 pp., illus. $4.00. w.

EXAMINATION OF WATER. Chemical and bacteriological. Wm. P. Mason. 131 pp. $1.25. w.

WATER-SUPPLY. Mainly from a chemical and sanitary standpoint. Wm. Ripley Nichols. 232 pp. $2.50. w.

SEWAGE AND BACTERIAL PURIFICATION OF SEWAGE. Methods of disposal, etc. Samuel Rideal, D.Sc. (English.) 278 pp. $3.50. w.

PUBLIC WATER-SUPPLIES. Requirements, resources and construction of works. F. E. Turneaure and H. L. Russell; with a chapter on pumping machinery by D. W. Mead. 733 pp., illus. $5.00. w.

MICROSCOPY OF DRINKING WATER. Methods of examination of and organisms found in water. George C. Whipple. 338 pp., illus. $3.50. w.

SEWERAGE. Design, construction and maintenance of sewer systems. A. Prescott Folwell. (English.) 445 pp., illus. $3.00. w.

MUNICIPAL IMPROVEMENTS. Manual of the methods, utility and cost of public improvements. W. F. Goodhue. 207 pp., illus. $1.75. w.

ECONOMIC DISPOSAL OF TOWNS' REFUSE. W. F. Goodrich. (English.) 340 pp., illus. $3.50. w.

SEWAGE DISPOSAL. Methods of disposal and purification. Wyncoop Kiersted. 182 pp. $1.25. w.

SEWER DESIGN. Treatise on sewer construction. H. N. Ogden. 234 pp., illus. $2.00. w.

WATER-SUPPLY ENGINEERING. Design, construction and maintenance of water-supply systems, both city and irrigation. A. Prescott Folwell. 562 pp., illus. $4.00. w.

WATER POWER. Outline of the development and application of the energy of flowing water. Joseph P. Frizell. 589 pp., illus. $5.00. w.

WATER FILTRATION WORKS. Purification of water by slow and rapid filtration and the design of works. James H. Fuertes. 283 pp., illus. $2.50. w.

FILTRATION OF PUBLIC WATER-SUPPLY. Construction and operation of rapid and slow filters and treatment of waters. Allen Hazen. 321 pp., illus. $3.00. w.

TOWERS AND TANKS FOR WATER-WORKS. Theory and practice of their design and construction. J. N. Hazlehurst. 216 pp., illus. $2.50. w.

DESIGN AND CONSTRUCTION OF DAMS. Includes masonry, earth, rock-fill and timber, and the principal types of movable dams. Edward Wegmann. 250 pp., illus. $5.00. w.

HIGHWAY CONSTRUCTION. Treatise on construction and maintenance of roads, streets and pavements. A. T. Byrne. 895 pp., illus. $5.00. w.

TEXT-BOOK ON ROADS AND PAVEMENTS. Country roads and city streets. F. P. Spalding. 213 pp., illus. $2.00. w.

STREET PAVEMENTS AND PAVING MATERIALS. Methods and materials of city street construction. George W. Tillson. 496 pp., illus. $4.00. w.

SEWERS AND DRAINS FOR POPULOUS DISTRICTS. Rules and formulas for dimensions and construction. J. W. Adams. $2.50. v.

PURIFICATION OF SEWAGE. Scientific principles of sewage purification and their application. Sidney Barwise. (English.) Illus. $2.00. v.

BACTERIAL PURIFICATION OF SEWAGE. Modern biological methods of purification. Sidney Barwise. (English.) Illus. $2.50 net. v.

CLEANING AND SEWERAGE OF CITIES. Translated from the German. R. Baumeister. Illus. $2.00. v.

ELECTRIC LIGHTING. Treatise on installation and operation of electric plants. F. B. Crocker. 2 vols., illus. $3.00 each. v.

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Waterloo, Ia.—The contract for the police station has been let to John F. Fleurant, at $13,398.

Xenia, O.—The contract for the library has been let to Thomas Owen.

SEWERS

Abbeville, S. C.—Bids have been asked for October 15 for $20,000 sewer bonds. City Clerk Chalmers.

Akron, O.—The construction of sewers has been under discussion.

Athol, Mass.—It was reported that $100,000 was available for sewers.

Baltimore, Md.—The Board of Estimates has decided that there need be no delay in the contraction of sewers.

Bath, Me.—The sewers may be extended on Washington street.

Centreville, O.—The Iowa Engineering Company, of Clinton, has made plans for a sewer system.

Chisholm, Minn.—Plans are being made for a sewer system.

Colo, Ia.—A drainage system is to be built.

Conshocken, Pa.—There is talk of building a sewer sysytem.

Cuyahoga Falls, O.—Plans have been approved for a sewer system to cost $185,000. Village Clerk.

Dayton, O.—The Board of Health urges that a number of sewers be built.

Denison, Ia.—A sewer system is soon to be constructed.

Devils, N. D.—A sewer system is under consideration.

E. St. Louis, Ill.—An outlet sewer may be built to cost $736,000. City Engineer Helm.

Ft. Worth, Tex.—There is talk of building a $30,000 sewer system. City Engineer Hawley.

Galveston, Tex.—A number of 8 12-inch lateral sewers will be built.

Georgetown, S. C.—Will build sewers to cost about $75,000.

Glenolden, Pa.—A sanitary sewer system is to be built.

Glenville, O.—Bids were asked on September 28 for $55,000 worth of St. Clair street sewer bonds. City Auditor Davies.

Gloucester City, N. J.—May lay 4,228 feet of 12 inch terra cotta sewer and 7,475 feet of 16 by 22 foot brick sewer.

Hiawatha, Kan.—Will plan for 6,000 feet of sewers.

Hobart, Ok. Ter.—A sewer system has been under consideration.

Hyattsville, Md.—May build a sewer system. The Mayor.

Jacksonville, Fla.—The council is in favor of building more sewers.

Jefferson City, Mo.—Eight 12-inch pipe sewers were to be placed in three districts. City Engineer J. C. Herring.

Kingston, N. Y.—The sewer in Broadway will be rebuilt.

Lake Charges, La.—May build a sewer system.

Lambertville, N. J.—A sewer is to be placed in Messeles street. Street and Water Board.

Lancaster, Pa.—Bids are wanted on October 5th for 15,000 feet of brick sewer. City Comptroller Rathfon.

Millburn, N. J.—It was reported that $140,000 worth of sewer bonds were sold.

Mt. Sterling, O.—A petition asks for a sewer.

New Decatur, Ala.—Bonds may be issued for sewers.

Norfolk, Va.—It is said that a sewer system in the 7th ward is contemplated.

Norristown, Pa.—Boro. Engr. Corson writes us that the borough will build 1,000 ft. of 20 inch sewer on Ford street and 300 ft. of 15 inch sewer on Oak street.

Ottawa, Ill.—Plans prepared for a sewer system in East Ottawa. City Engineer Wilson.

Paterson, N. J.—3,490 feet of 12 to 36 inch pipe sewers to be built. Street Commissioner Brett.

Perth Amboy, N. J.—Smith street was to be sewered, according to reports.

Pine Bluff, Ark.—A sewer system in district No. 3 is being planned. Capt. J. H. Haney, Little Rock.

Pittsfield, Mass.—It is said that 50,000 feet of pipe sewer will be laid. Board Public Works.

Pulaski, Ark.—The Pulaski Sewerage Company has been formed to build and maintain sewers. Chris. Ledwige.

St. Joseph, Mo.—Ordinances call for sewers in several streets. City Clerk Beach.

Salem, Mass.—It is reported that plans are to be made for sewers.

Santa Rosa, Cal.—The sewer system may be enlarged. City Engineer Ricksecker.

Sharpsville, Pa.—$18,000 may be spent on sewers. W. A. Grabier, Council Secretary.

Toledo, O.—Resolutions call for sewers in several streets. City Clerk Nauts.

Waukegan, Ill.—Plans have been prepared for sanitary sewers.

W. Orange, N. J.—A sewer system will be installed.

Winchester, Mass.—Reports state that this place has been considering sewers.

Contracts Awarded

Alexandria Bay, N. Y.—Contract for a sewer system let to W. H. Cookman, Niagara Falls, at $56,564.

Brainerd, Minn.—Contract let to Judd Wright for 5,300 feet of sewer at $12,729.

Charleston, S. C.—Contract for laying sewer pipe let to George O. Tenny, Spartansburg, at $23,300.

Corning, N. Y.—Contract for brick and tile sewers let Hurd, Sherman & Company, Syracuse.

Cudahy, Wis.—J. H. Whaling has contract for sewer system at $28,716.

Elizabeth, Pa.—Contract let to D. V. Ault Company, McKeesport, at $9,290, for a sewer system.

(Continued on page 32.)

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Water Supply, Water Purification, Water Power, Sewerage and Sewage Disposal. Examinations of Projects, Plans, Specifications and Estimates of Cost. Construction Superintended.

Elkins, W. Va.—Contract for a sewer system let to Dean & Hoffman, Morgantown, at $6,000.

Ft. Dodge, Ia.—Contract let C. A. Kling for 8-inch pipe sewers at 34 cts. per lin. ft., flush tanks at $50.

Ft. Lawton, Wash.—Contract let Frank A. Keasal and Wm. C. Smith, Tacoma, for a sewer system at $4,500.

Ft. Worth, Tex.—The sewers may be extended at a cost of $30,000.

Fowlerton, Ind.—Contract for sewers awarded to E. E. Sollar .

Green Bay, Wis.—Contracts were awarded to J. K. Delaney, Shaefer Bros., Lagers & Kapinski, and Dean & Foley, for sewers.

Hartford, Conn.—The Hartford Paving & Constr. Company, 703 Main street, has contract for sewers in three streets.

Hobart, Ok. Ter.—Contract was awarded the American Light & Water Company, Indianapolis, for $20,000 sewer system.

Hughesville, Pa.—Contract for sewer let Corydell Construction Company, Williamsport, at $3,000.

Manchester, N. H.—Contract for 1,200 feet of sewer let to Jas. Reilly.

Montpelier, O.—Bodette & Sheehan, Toledo, received the contract for pipe sewers at $10,323.

Norristown, Pa.—Boro. Engr. S. C. Corson wrote us that the contract for 8 inch sanitary sewer on Swede street was awarded R. J. Phipps at 1.08 cts. for main trench, 1.04 cts. for laterals and $88 each for 250 gallon Miller flush tanks. Also contract for 18 inch sewer on Buttonwood street and 15 inch sewer on Airy street at 74 cts. per foot. Pipe and castings furnished by borough.

Northfield, Vt.—The contract for sewer in Main street let to Fred Levy & Co., Springfield, Mass.

Oelwein, Ia.—Contract let to R. C. DeLaHunt, Cedar Rapids, for sewer on 2nd avenue, East.

Penn Yan, N. Y.—Contract for sewer system let to Hodgkins, Walker & Williams, Elmira, at $69,201.

Pine Bluff, Ark.—Contract let Black & Laird, Kansas City, Mo., for sewer system in district No. 2.

Providence, R. I.—Contract for 3,933 ft. of 8 to 28 inch sewer let Fred E. Shaw.

Scranton, Pa.—R. D. Myers, Wilkes-Barre, is reported to have bid the lowest for pipe work on Ingersoll sewer at $12,000.

Sterling, Ill.—Contract let B. Carpenter, 11948 Eggleston avenue, Chicago, for East Broadway sewer system.

Troy, N. Y.—Contract for sewer in Simmons and another avenue let to John W. Stanton.

Union, S. C.—Contract for sewers let George O. Tenny, Spartansburg, at $23,300.

Washington, D. C.—Contract for section B of B street sewer let to Guiney, Jones & Cavan, and for section C to Andrew Gleeson.

W. Hoboken, N. J.—Contract let R. Capone for Oak street sewer.

Yazoo City, Miss.—John M. Healy, 519 Opera House Bldg., Chicago, has contract for sewers.

Youngstown, O.—Anthony O'Hara bid the lowest at $17,370 for sewer in Wilkes avenue.

LIGHTING AND TELEPHONE

Appleton, Wis.—Franchise for gas plant has been asked by Louis E. Hart.

Arvada, Colo.—A company has been formed to put in an electric lighting plant.

Avoca, Neb.—Has voted bonds for lighting and heating.

Bagley, Minn.—Franchise for electric lighting plant has been let to M. J. Kolb and Bohmer.

Bisbee, Ariz.—A franchise for gas and electric light plants has been let to M. J. Donahue.

Boyne City, Mich.—A franchise for an electric light plant has been let to Ernest A. Stowe and C. C. Fallmer, Grand Rapids.

Brownsville, Tex.—A franchise for electric light and water works has been let to John W. Maxcy, Houston.

Buchanan, Mich.—A municipal light plant may be erected. Mayor G. H. Black.

Cambria, Wis.—Will not vote on a lighting plant. Village Clerk.

Carrollton, Ga.—The Gainsboro Telephone Co. will spend $100,000 on extensions.

Chestertown, Md.—A franchise for a gas plant has been let to Nat. T. Meguiniss, Baltimore.

Colton, Cal.—A franchise for a gas plant has been let to George B. Ellis.

Columbus, O.—$100,000 bonds have been recommended for completing the electric plant by the Board of Public Service.

Columbus, O.—Mayor Jeffrey wants the wires in the business sections placed in conduits.

Corona, Cal.—Has voted against bids for the electric light plant. City Clerk Wood.

Crooksville, O.—A franchise for an electric light plant has been let to Thomas McNichol.

Culpepper, Va.—A franchise for an electric light plant has been let to Messrs. Rockford, Bel Air, Md.

De Soto, Mo.—Will erect the proposed edectric light plant. Mayor Slawson.

Douglas, Neb.—May put in a gasoline plant for the city.

Downer's Grove, Ill.—The LaGrange Gas Co. will place mains in Main street.

Dows, Ia.—Is talking of a lighting plant.

(Concluded on page 33.)

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Elkton, S. D.—A gas plant will probably be built by the Board of Trustees.

Fairmont, Minn.—May vote on $16,000 bonds for putting an electric light plant in shape.

Fayetteville, W. Va.—A franchise for an electric light plant has been let to E. W. Becker.

Ft. Wayne, Ind.—The city is contemplating an electric light plant of 600 to 800 arc and 40,000 incandescent lights capacity. City Clerk Schmidt.

Fosston, Minn.—The city will add to the electric light plant.

Galva, Ill.—A municipal electric light plant may be built.

FIRE APPARATUS

Albuquerque, N. M.—A fire alarm system will probably be put in.

Armada, Mich.—A department has been formed.

Chester, Pa.—Will ascertain the cost of a chemical engine. Pres. Riley, Select. Council.

Colwyn, Pa.—Will form and equip a department.

De Kalb, Ill.—Will spend $10,000 to equip a paid department.

Depew, N. Y.—Will put in a fire alarm system.

Garwood, N. J.—A department has been formed.

Hartford, Conn.—Will build an engine house in the tenth ward.

Knoxville, Tenn.—Must purchase hose soon.

Lancaster, O.—Bids are wanted for $1,500 bonds for a combination hose and ladder wagon.

Pittsburg, Pa.—The council has been asked to buy chemical engines to protect Hilton Ward residents.

Plainville, Conn.—Will put in a new apparatus. Chief Hart.

Portland, Ore.—The contract for a fire boat has been let to Morgan Bros. & Co. for $56,600.

Reamstown, Pa.—A new company has been formed.

Sacramento, Cal.—More hose is needed. Chief Guthrie.

Santa Monica, Cal.—The Ocean Park residents want two hose wagons and a chemical engine.

Saratoga, N. Y.—Will erect a new fire station on Lincoln avenue.

Sheffield, Mo.—Will form a fire department. Engineer Pike.

Towner, N. D.—A department is being formed.

Union Hill, N. J.—1,500 ft. of hose are badly needed. Chief Behr.

Wagner, S. D.—A volunteer department has been formed. W. W. Turner, foreman.

(End.)

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